ASANTÉ

IntraCore™ 65120 Series

Gigabit Ethernet Switches

User's Manual

Quick Start Guide

Follow these steps to install the IntraCore 65120:

1. Open the box and check the contents. See *Chapter 2.1 Package Contents* for a complete list of the items included with your IntraCore 65120.
2. Install the IntraCore 65120 switch in an equipment or wall rack, or prepare it for desktop placement.
3. Connect the power cord to the switch.
4. Connect network devices to the IntraCore 65120.

Refer to Chapters 3 and 4 to configure the IntraCore 65120 for management capabilities.

For more information on installing the IntraCore 65120, please refer to *Chapter 2.2 Installation*.

IntraCore™ 65120 Series

Gigabit Ethernet Switches

User's Manual

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Table of Contents

Chapter 1 Introduction

Thank you for purchasing the Asanté IntraCore 65120 Series Gigabit Ethernet switch. In addition to the traditional console and telnet interface, this switch can also be configured and managed through a user-friendly web browser interface. With an on-board HTTP server, users can access the box with the use of popular browsers such as Netscape Navigator and Microsoft I.E (Netscape Navigator 4.0 and IE 4.01 or higher required). The IntraCore 65120 also supports firmware updates using the TFTP protocol.

This manual is designed for System Administrators, Information Technologies Professionals, and other users who are familiar with the setup and operation of managed networks. This chapter describes the functional overview of the Gigabit Ethernet switch:

- Front/Rear Panel Description
- LED Definitions
- Management

1.1 Front Panel Descriptions

The front panel contains all the Ethernet ports, Console port, and LEDs. There is one System LED, four LEDs for each copper port (model 65120-2G only), and one LED for each GBIC port. Detailed definitions can be found Table 1-1.

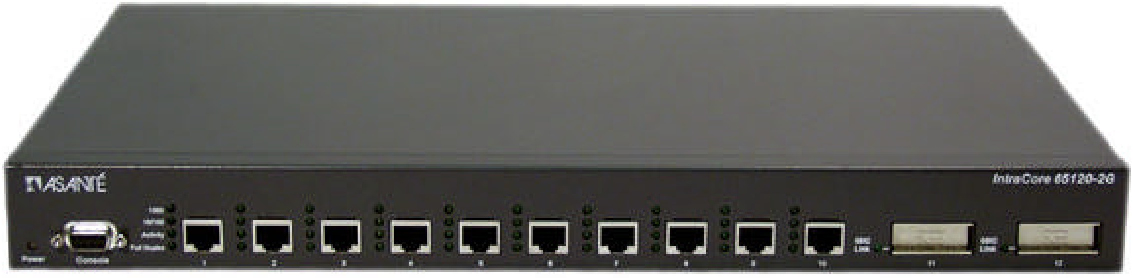


Figure 1-1: 65120-2G

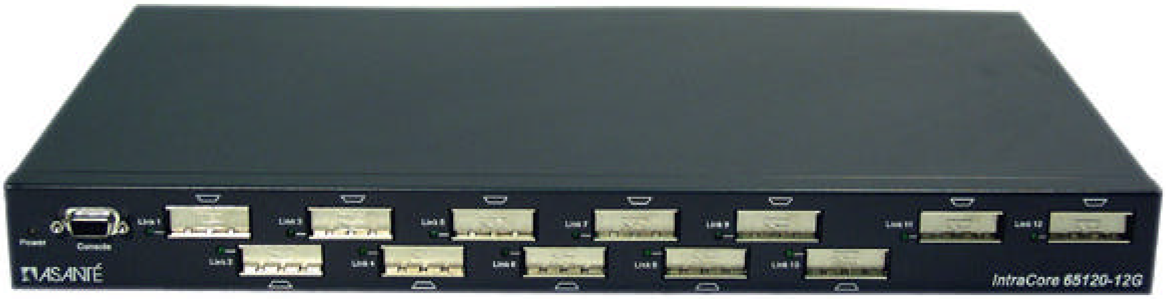


Figure 1-2: 65120-12G

1.2 LED Definitions

The following Table describes the LEDs, which allows monitoring of the status of your switch:

Port	LED	Color	ON	OFF
N/A	Power/System	Green Amber Red	Power is up Booting Failure	Power is off or system is initializing
10/100/1000	1G Link	Green	A valid 1000 Mbps link has been established	No 1000 Mbps link has been established
10/100/1000	10/100 Link	Green	A valid 10/100 link has been established	No 10/100 Mbps link has been established
10/100/1000	Activity	Blinking Green	Traffic detected	No traffic detected
10/100/1000	FDX/HDX	Solid Green Blinking Green	Full Duplex Collisions occurring in half-duplex	No Full Duplex link has been established, or no collisions are occurring in half-duplex
GBIC	Link	Green	A valid link has been established	No GBIC link has been established

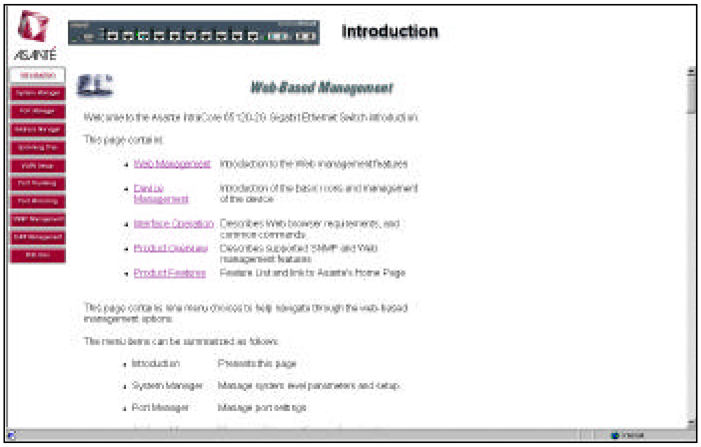
Table 1-1 LEDs

1.3 Management

There are three different methods by which a user can manage the switch: web, console/telnet, or SNMP.

1.3.1 Web-Based Interface

Users can configure the switch, monitor the LED panel, and display statistics graphically with Netscape Navigator browser version 4.0 or higher and Microsoft IE version 4.01 or higher. With Internet access, users can link directly to the local switch's home page. Detailed description is found in *Chapter 3 Web-Based Management.*



Web-Based Management

Welcome to the Asante IntraCore 65120-2G Gigabit Ethernet Switch introduction.

This page contains:

- Web Management Introduction to the Web management features
- Device Management Introduction of the basic roles and management of the device
- Interface Operation Describes Web browser requirements, and common commands
- Product Overview Describes supported SNMP and Web management features
- Product Features Feature List and link to Asante's Home Page

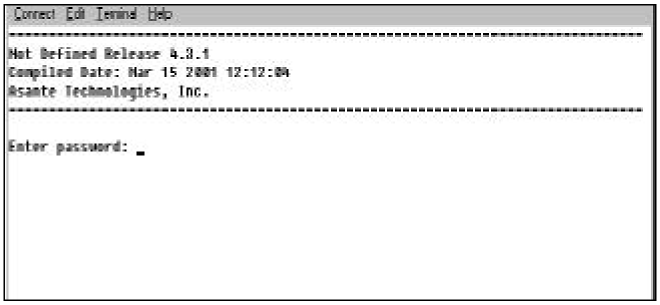
This page contains nine menu choices to help navigate through the web-based management options.

The menu items can be summarized as follows:

- Introduction Presents this page
- System Manager Manage system level parameters and setup.
- Port Manager Manage port settings

1.3.2 Console Interface

Users can also access the switch in a more traditional way by connecting a PC or terminal to the console port or by telnet across the network. The menus are organized in a manner similar to the web-based interface. A detailed description is in *Chapter 4 Console Interface*.



```
=================================================================================
Not Defined Release 4.3.1
Compiled Date: Mar 15 2001 12:12:04
Asante Technologies, Inc.
=================================================================================

Enter password: _
```

1.3.3 SNMP Interface

Since the switch supports SNMP, users can manage the switch with an SNMP-compatible management station running platforms such as HP OpenView. It also supports a comprehensive set of MIB extensions along with MIB II, Ethernet MIB, the 802.1d bridge MIB, and the 4 groups of RMON.

SNMP v.1 is implemented. The SNMP agent decodes the incoming SNMP messages and responds to these requests with MIB objects that are stored in the database. For the statistics and counters of MIB Objects, the SNMP agent periodically (every 5 seconds) updates the MIB Objects.

1.3.4 Management Information Bases (MIBs)

The system supports the following MIBs:

1. MIB II (RFC 1213)
2. Ethernet Interface MIB (RFC 1643)
3. Bridge MIB (RFC 1493)
4. 4 groups of RMON (RFC 1457)
    - The Ethernet Statistics Group
    - The Ethernet History Group
    - The Alarm Group
    - The Event Group
5. Enterprise MIB
    - CommGroup: Allows users to configure the community database
    - HostGroup: Allows users to configure the hosts
    - MiscGroup: Allows users to configure miscellaneous items
    - SpanGroup: Allows users to configure the Spanning Tree
    - ConfigGroup: Allows users to configure the system

Chapter 2 Installation and Setup

This chapter provides the following information:

- Package Contents
- Installation
- Setup
- Password Protection
- IP Assignment
- SNMP Host Access

2.1 Package Contents

The IntraCore 65120 package contains the following:

- IntraCore 65120 Series Gigabit Ethernet switch
- *Getting Started Guide* (printed)
- Power Cord
- Self-adhesive rubber feet for desktop placement
- Rack mount kit for rack installation
- IntraCore 65120 CD-ROM with user's manual, utilities and product information

If any of these items are missing, contact your dealer immediately.

2.2 Installation Overview

The switch may be installed into an equipment or wall rack, or it may be placed on a level and stable desktop surface.

The following guidelines will help you prepare to install the switch in such a way that it has the proper power supply and environment.

2.2.1 Safety Overview

The following information provides safety guidelines to ensure your safety and to protect the switch from damage.

Note: Be aware, however, that this information is intended as a guideline, and may not include every possible hazard to which you may be exposed. Use caution when installing this switch.

- Only trained and qualified personnel should be allowed to install or replace this equipment.
- Always use caution when lifting heavy equipment
- Keep the unit clean
- Keep tools and components off the floor and away from foot traffic
- Avoid wearing rings or chains (or other jewelry) that could get caught in the switch. Metal objects can heat up and cause serious injury to persons and damage to the equipment. Avoid wearing loose clothing (i.e. ties or loose sleeves)

When working with electricity, follow these guidelines:

- Before accessing the interior of the switch, locate the emergency power-off switch for the room you are in
- Disconnect all external cables before installing or removing the cover
- Do not work alone when working with electricity
- Always check that the power has been disconnected from the circuit
- Do not tamper with the equipment

- Examine your work area for potential hazards (I.e. wet floors, ungrounded cables, etc.

2.2.2 Recommended Installation Tools

You will need the following tools and equipment (not included) to install the IntraCore 65120 switch:

- Number 1, number 2 and 3/16-inch flat-blade screwdrivers
- Antistatic mat or foam

2.2.3 Power Requirements

The electrical outlet should be located near the IntraCore 65120 and be easily accessible. It must also be properly grounded.

Make sure the power source adheres to the following guidelines:

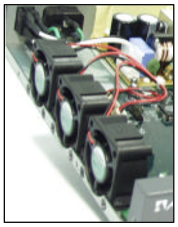
- Power: Auto Switching 110/240 VAC
- Frequency range: 50/60 Hz
- Maximum input AC Current: 1.0A at 115 VAC full load

2.2.4 Environmental Requirements

The IntraCore 65120 must be installed in a clean, dry, dust-free area with adequate air circulation to maintain the following environmental limits:

- Operating Temperature: 0° to 40° C (32° to 104° F)
- Storage Temperature: -20° to 70° C (-4° to 158° F)
- Relative Humidity: 10% to 90% non-condensing
- Storage Relative Humidity: 10% to 95% non-condensing

Avoid direct sunlight, heat sources, or areas with high levels of electromagnetic interference.



2.2.5 Cooling and Airflow

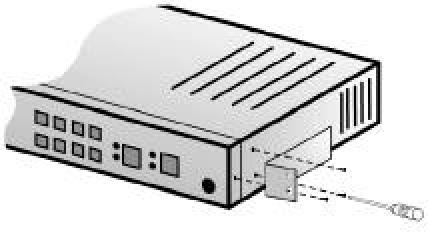
The IntraCore 65120 uses internal fans for air-cooling. Do not restrict airflow by covering or obstructing air vents on the sides of the switch.

2.2.6 Installation into an Equipment Rack

To install the unit in an equipment rack, use the following procedure:

Important! Before continuing, disconnect all cables from the IntraCore 65120.

1. Place the IntraCore 65120 on a flat, stable surface.
2. Locate a rack-mounting bracket (supplied) and place it over the mounting holes on one side of the unit.
3. Use the screws (supplied) to secure the bracket (with a Phillips screwdriver).
4. Repeat the two previous steps on the other side of the unit.
5. Place the switch in the equipment rack.
6. Secure the switch by securing its mounting brackets onto the equipment rack.



Important! Make sure the unit is supported until all the mounting screws for each bracket are secured to the equipment rack. Failure to do so could cause the unit to fall, which may result in personal injury or damage to the unit.

2.2.7 Equipment Rack Guidelines

- Size: 17.25 x 10.0 x 1.7 inches
  423 x 245 x 43 mm
- Ventilation: Ensure that the rack is installed in a room where the temperature remains below 40° C (104° F). Be sure that there are no obstructions, such as other equipment or cables, blocking airflow to or from the IntraCore 65120 vents.
- Clearance: In addition to providing clearance for ventilation, ensure that there is adequate clearance for servicing the IntraCore 65120 from the front.

2.3 Setup

The following sections describe the various methods for setting up and managing the switch.

2.3.1 Connecting to a Console or Workstation

When attaching a workstation to the device, a standard straight-through CAT5 cable may be used, even when the workstation is attached via a patch panel. However, when attaching to another switch or attaching workstations via hubs, a crossover cable will need to be used. It is recommended that the switch be kept off the network until proper IP settings have been set.

To connect the switch to a console or computer, setup the system in the following manner:

1. Plug power cord into the back of unit.
2. Attach a straight through serial cable between the RS232 port and a COM port on the PC.
3. Setup a Hyperterminal (or equivalent terminal program) in the following manner:

   - Choose the appropriate COM port (COM1, COM2, etc)
   - Set the data rate to 9600 Baud
   - Set data format 8 data bits, 1 stop bit and no parity
   - Set flow control to NONE
   - In setting under Properties, choose VT100 for Emulation mode
   - Select Terminal keys for Function, Arrow and Ctrl keys. Be sure the setting is for Terminal keys, NOT Windows keys

Now that terminal is setup correctly, power on the switch (boot sequence will display in terminal).

2.3.2 Connecting Via the Web Browser Interface

To connect to the switch via your web browser, you must first have configured your computer's IP address to be on the same IP address subnet as the switch (**192.168.0.x**). For more information on how to configure your TCP/IP settings, please refer to your computer manufacturer's user's manual.

You may now launch your web browser and enter the switch's default IP address into the address field. The Introduction page will appear, and you may proceed through the pages to configure each variable. Password Protection is disabled by default. If this feature is enabled (via console or telnet) without having set your own password, the default password is **Asante**. **Asante** is case sensitive and must appear exactly as it is shown here. See *Chapter 3 Web-Based Management* for more information on configuring the switch via your web browser.

2.3.3 Connecting Via Telnet

To connect to the switch via a telnet session, you must first have configured your computer's IP address to be on the same IP address subnet as the switch (192.168.0.X). For more information on how to configure your TCP/IP settings, please refer to your computer manufacturer's user's manual.

You may now run a telnet session to configure and manage your switch. The Main Menu will appear (unless you have enabled the Password Protection feature), allowing you to select the variables that you wish to configure. See *Chapter 4 Console Interface* for more information on configuring the switch via telnet.

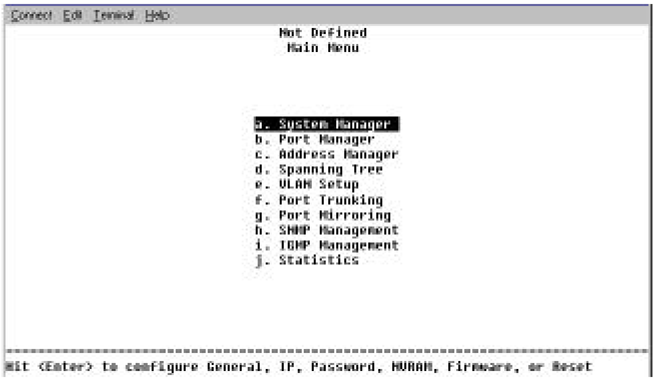
2.4 Password Protection

The Password Protection feature is disabled by default, allowing immediate access to ANYONE on the network. To protect your switch from unauthorized changes to the configuration, you must enable the protection feature. It can only be enabled through the console interface.

To set a password via telnet, follow these steps:

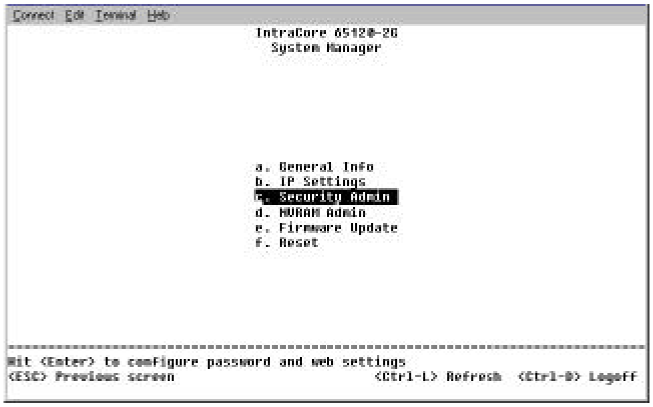
Note: Use the arrow keys to move within a menu. Press **Enter** to proceed, and press the **Esc**. Key to return to the previous screen. Use the spacebar to toggle between highlighted choices. Please refer to Chapter 4.2 for more detailed description of the common keystrokes used within the menus.

1. From the Main menu, use the arrow keys to select ***a.*** *System Manager* and press **Enter**.



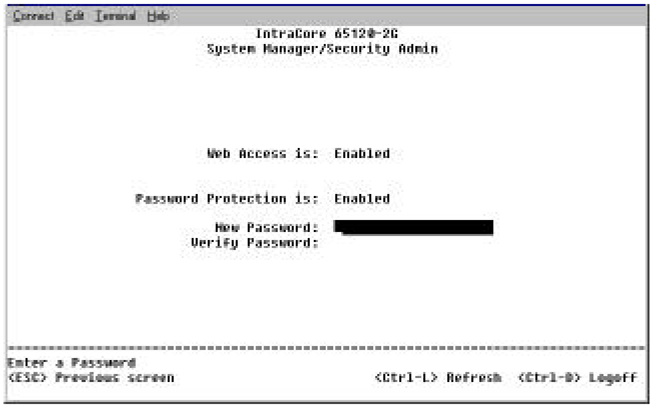
```
                              Not Defined
                               Main Menu



                          a. System Manager
                          b. Port Manager
                          c. Address Manager
                          d. Spanning Tree
                          e. VLAN Setup
                          f. Port Trunking
                          g. Port Mirroring
                          h. SNMP Management
                          i. IGMP Management
                          j. Statistics


================================================================================
Hit <Enter> to configure General, IP, Password, NVRAM, Firmware, or Reset
```

2. Select ***c.*** *Security Administration*.



```
                           IntraCore 65120-2G
                             System Manager



                          a. General Info
                          b. IP Settings
                          c. Security Admin
                          d. NVRAM Admin
                          e. Firmware Update
                          f. Reset


================================================================================
Hit <Enter> to configure password and web settings
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

3. Use the arrow keys to highlight a field. Press the spacebar to enable Password Protection.



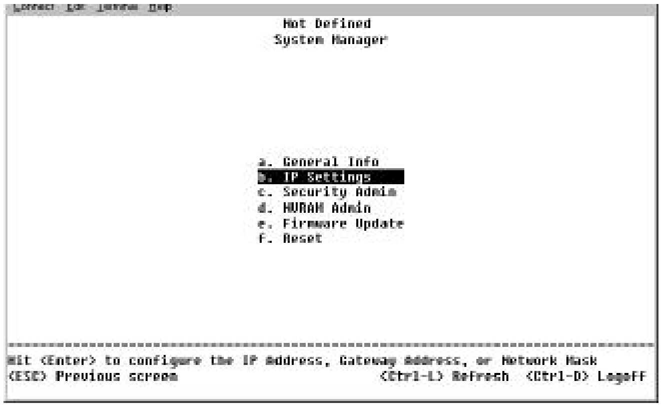
```
                         IntraCore 65120-2G
                   System Manager/Security Admin



                 Web Access is:  Enabled


        Password Protection is:  Enabled
                  New Password:
               Verify Password:



================================================================================
Enter a Password
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4. Now enter your password, pressing **Enter** when done.
5. Enter the password again to confirm, pressing **Enter** when done.
6. Press **Ctrl+W** to save.

2.5 IP Assignment

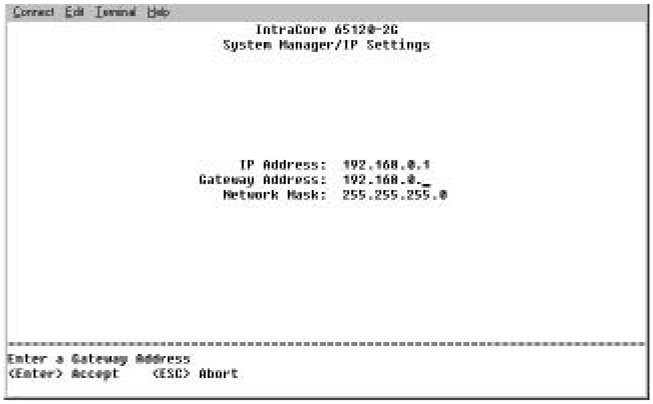
To assign an IP address (other than the default IP address):

1. From the Main Menu, select ***a***. *System Manager*.
2. Select ***b***. *IP address*.



```
                                 Not Defined
                               System Manager



                          a. General Info
                          b. IP Settings
                          c. Security Admin
                          d. NVRAM Admin
                          e. Firmware Update
                          f. Reset



================================================================================
Hit <Enter> to configure the IP Address, Gateway Address, or Network Mask
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

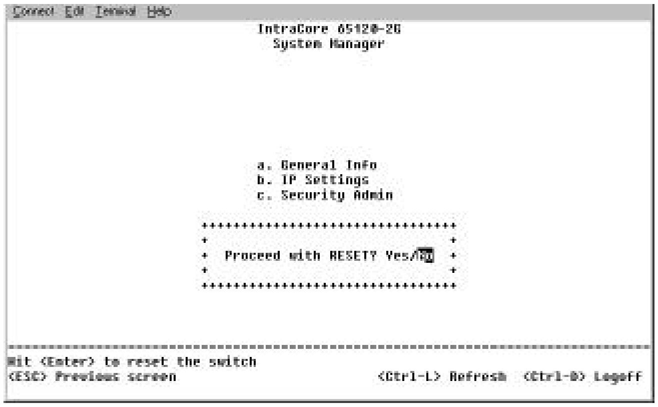
3. In the first field enter the proper IP address for this system (consult your network administrator).



```
                         IntraCore 65120-2G
                     System Manager/IP Settings



                   IP Address:  192.168.0.1
              Gateway Address:  192.168.0._
                 Network Mask:  255.255.255.0



================================================================================
Enter a Gateway Address
<Enter> Accept    <ESC> Abort
```

4. Enter the address of the default gateway for the network to which the switch is attached.
5. Finally enter the appropriate network mask for this network (again consult your network administrator).

6. Press **Ctrl-W** when done to save these changes.
7. After making IP changes, the system needs to be reset. Press the **Esc** key to return to the System Manager Menu.
8. Go to *System Manager/Reset*. Use the arrow keys to select *Yes* to proceed with Reset.



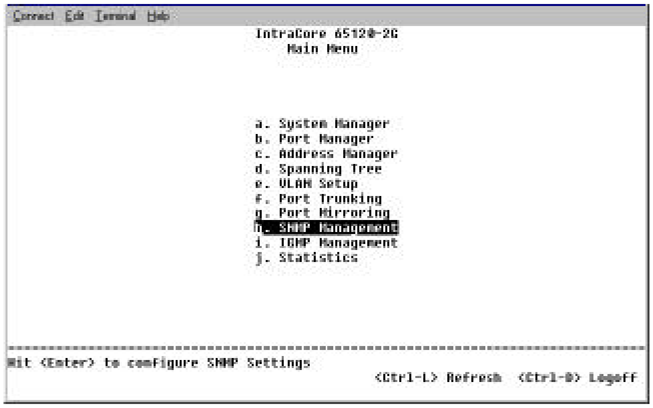
```
                         IntraCore 65120-2G
                           System Manager



                          a. General Info
                          b. IP Settings
                          c. Security Admin

                   ++++++++++++++++++++++++++++++++
                   +                              +
                   +  Proceed with RESET? Yes/No  +
                   +                              +
                   ++++++++++++++++++++++++++++++++

--------------------------------------------------------------------------------
Hit <Enter> to reset the switch
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

2.6 SNMP Host Access

When the reset is complete the box should be seen on the network. If not, check the IP information again with your network administrator to ensure that all the data is correct. By default, any PC on the network can manage the switch via the Web Interface. However, if this is not desired, you may enable Host Authorization, allowing only hosts that are listed in the SNMP Host Table to access the box.

Follow these steps to configure Host Access:

1. Choose ***a***. *System Manager* from the Main Menu.
2. Next choose ***h.*** *SNMP Management*.



```
                         IntraCore 65120-2G
                              Main Menu


                          a. System Manager
                          b. Port Manager
                          c. Address Manager
                          d. Spanning Tree
                          e. VLAN Setup
                          f. Port Trunking
                          g. Port Mirroring
                          h. SNMP Management
                          i. IGMP Management
                          j. Statistics


--------------------------------------------------------------------------------
Hit <Enter> to configure SNMP Settings
                                               <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

3. Select **Host Table** by using the arrow keys and pressing **Enter**.
4. Enter the host name and IP address. Repeat this for as many hosts as necessary. Enter *Web Interface* for the community string. Press the spacebar when *Disabled* is highlighted. The status will change to *Active*.
5. When done entering hosts, press **Ctrl+W** to save this data.

For other management tasks, please refer to Chapters 3 and 4. To review switching concepts, please refer to Chapter 6.

Chapter 3 Web-Based Management

Web-Based Management allows switch configuration changes to be made using an Internet Web browser. This interface also allows for system monitoring of the Switch.

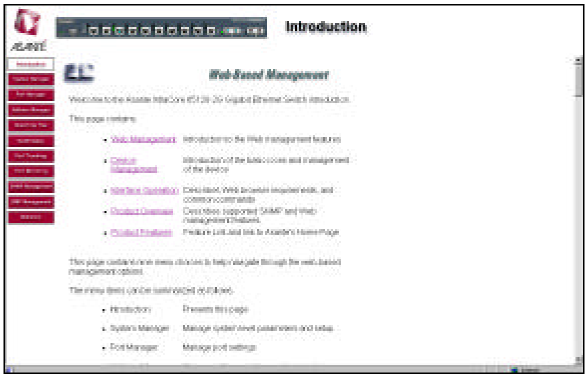
Buttons featured are:

- **Reload**: Pulls that screen's data from current values on the system
- **Apply**: Submits change request to system and refreshes screen data

Please refer to *Chapter 6 Switching Concepts* to review any features that are not familiar to you.

3.1 Web Pages

Connect to the switch through your web browser (i.e. Netscape Navigator) by using the default IP address 192.168.0.1. A login screen will appear prompting for an administrator password (only if the password is enabled). The User Name will always be **root**. Enter the password to access the switch's management mode. Once the password is entered correctly, the front page will appear.



Introduction

Web-Based Management

Welcome to the Asante IntraCore 65120-2G Gigabit Ethernet Switch introduction.

This page contains:

- Web Management: Introduction to the Web management features
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- Interface Operation: Describes Web browser requirements, and common commands
- Product Overview: Describes supported SNMP and Web management features.
- Product Features: Feature List and link to Asante's Home Page

This page contains nine menu choices to help navigate through the web-based management options.

The menu items can be summarized as follows:

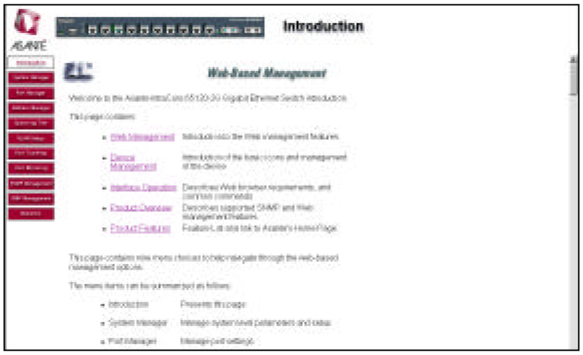
- Introduction: Presents this page
- System Manager: Manage system level parameters and setup
- Port Manager: Manage port settings

Note: Password protection is optional and can only be enabled through the console interface. If the password protection is enabled without having set your own password, the default password is **Asante**. **Asante** is case sensitive and should be entered exactly as shown.

There are eleven menu options available:

- Introduction
- System Manager
- Port Manager
- Address Manager
- Spanning Tree
- VLAN Setup
- Port Trunking
- Port Mirroring
- SNMP Management
- IGMP Management
- Statistics

3.2 Introduction



Introduction

Web-Based Management

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This page contains nine menu choices to help navigate through the web-based management options.

The menu items can be summarized as follows:

- Introduction — Presents this page.
- System Manager — Manage system level parameters and status.
- Port Manager — Manage port settings.

This page briefly describes the web-based management features, device management and Interface operation. It contains a product overview and product features.

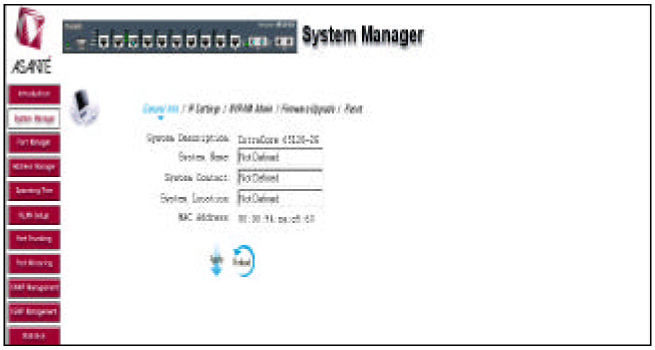
3.3 System Manager

The system manager contains all system operations and general information. It is organized with several sub-folders:

- General Info: General system information and administration
- IP Settings: IP parameters
- NVRAM Admin: Save configuration or reset to factory defaults
- Firmware Update:TFTP the latest firmware for update
- Reset: Reset the switch

3.3.1 General Info

The following fields are accessible under the general info page:



System Manager

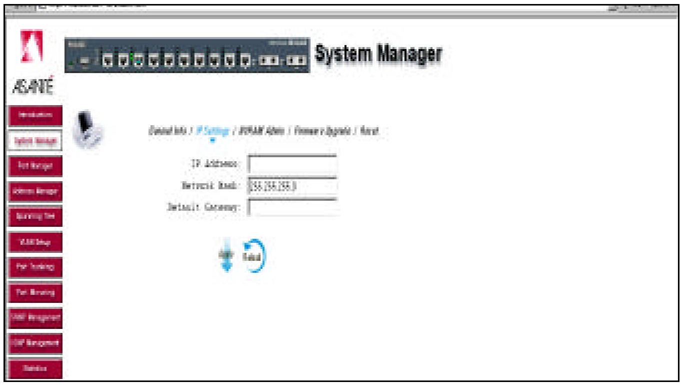
System Description: IntraCore 65120-2G
System Name: Not Defined
System Contact: Not Defined
System Location: Not Defined
MAC Address: 00:00:94:[illegible]

- System Description
- System Name
- System Contact
- System Location
- MAC Address

The Media Access Control (MAC) address and the System Description are not configurable.

3.3.2 IP Settings

There are three tunable parameters to be set by the system administrator:

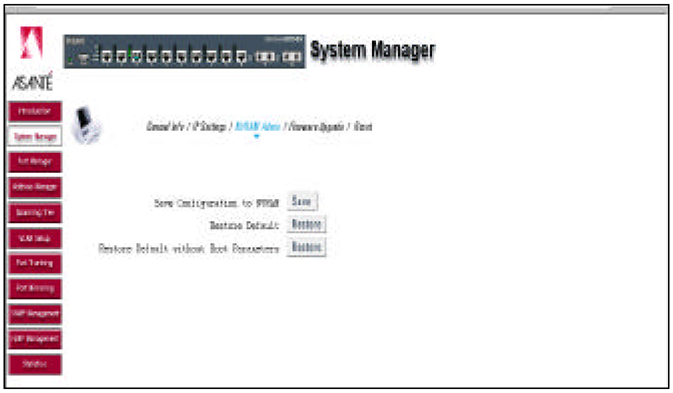

ASANTÉ
System Manager
General Info / IP Settings / NVRAM Admin / Firmware Upgrade / Reset
Apply
Reload

IP Address:
Network Mask: 255.255.255.0
Default Gateway:

- Enter site-specific IP address, Gateway address and Network mask
- Click **Apply** to change the IP settings
- Save Configuration to NVRAM and reset the system to implement the changes

3.3.3 NVRAM Admin

After making any changes to the screens within the Web Interface, users must save the changed settings to Non-Volatile Random Access Memory (NVRAM). This is done in the system administration screen in order for the new settings to remain after a system reboot.


ASANTÉ
System Manager
General Info / IP Settings / NVRAM Admin / Firmware Upgrade / Reset
Save Configuration to NVRAM
Save
Restore Default
Restore
Restore Default without Boot Parameters
Restore

Save Configuration to NVRAM

- Click on the **Save** button to save configuration to NVRAM

Restore Defaults

- Click on **Restore Defaults** to reset the switch's parameters to their original default settings. In order for changes to occur, you must reset the switch.

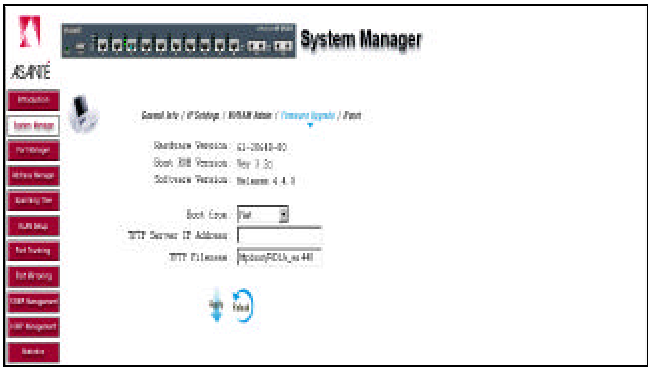
  Note: Network IP settings (i.e. IP address, Gateway Address, Network Mask) will not be affected by this command.

Restore Defaults without Boot Parameters

- Click on **Restore Defaults without Boot Parameters** to reset MOST of the switch's parameters, but leaves the IP address information and the boot loader configuration alone, so that the switch is still up and manageable.

3.3.4 Firmware Update

On the Firmware Update screen, the system can be configured to download and boot from a new image off the network (Please refer to Chapter 5 when updating software). Choose from the following options:



Hardware Version: 61-20410-00
Boot ROM Version: Rev 3.3c
Software Version: Release 4.4.3

Boot From: Net
TFTP Server IP Address:
TFTP Filename: /tftpboot/RD14_xx441

Net option:

This option allows the user to try out a new image before upgrading. It requires a TFTP server and a server IP address to retrieve the specified image from the given IP address. The new image will not overwrite the one in the flash (This option is the default setting.).

Net & save option:

This option requires the same setup as the *Net option*, i.e. TFTP server and a new image. However, it copies the image to the flash directly and the system boots from the flash afterwards.

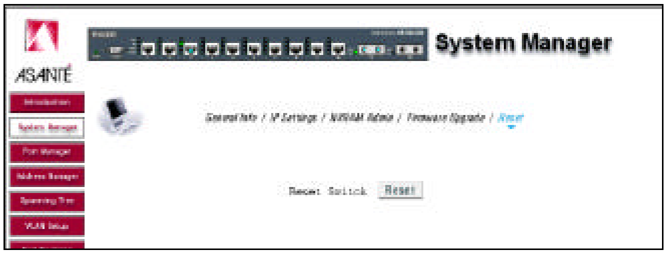
Last Saved option:

This option will automatically show up after the *Net & save* option is selected and the unit is reset. Save the configuration to NVRAM and reset the switch. The image will load automatically after the switch resets.

Enter the TFTP Server IP Address and Filename information in the appropriate fields.

3.3.5 Reset

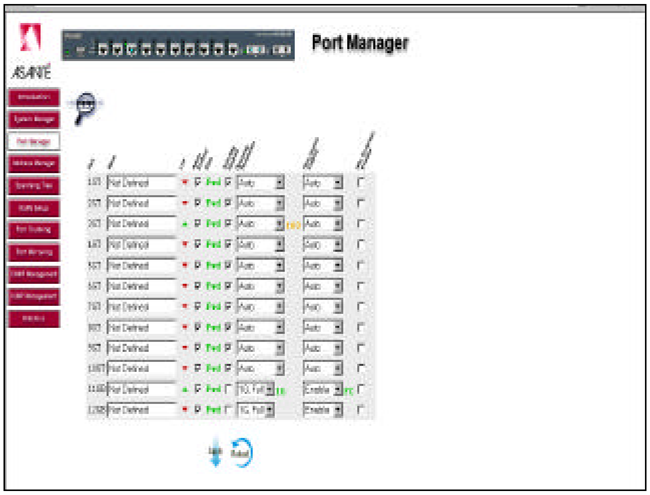
In this screen the user can reset the switch. This is primarily used to update the firmware or restore defaults.



Reset Switch Reset

3.4 Port Manager

This page will allow access to the port parameters. The configurable parameters are available as follows:



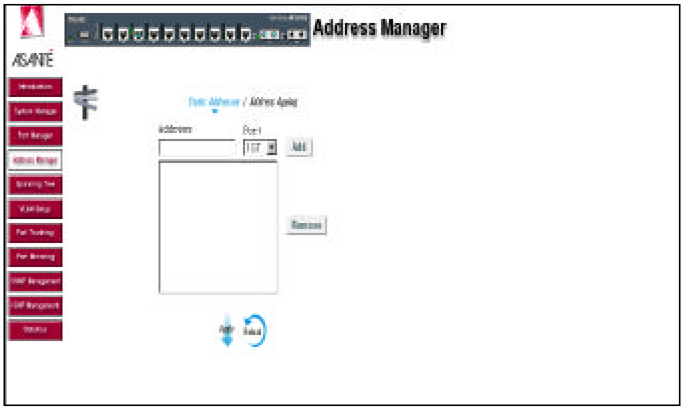
- Port Name
- Port Enable
- Auto Negotiation
- Operating Parameters
- Flow Control
- HOL Blocking

3.5 Address Manager

The Address Manager allows you to add or remove static address entries as well as change the dynamic address aging times.

3.5.1 Static Addresses

Any system whose MAC address and the port number are listed in this screen will not be purged from the system's forwarding table by the Aging process.



Add a new entry:

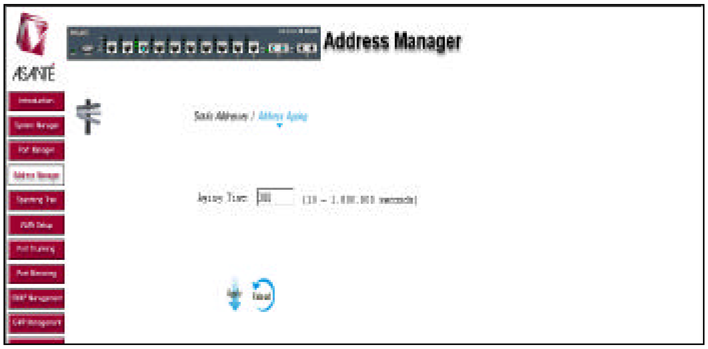
- Enter the MAC address and port in the appropriate boxes (You must enter the MAC address in the form XX:XX:XX:XX:XX:XX)
- Click **Add**

Remove an existing entry:

- Highlight that entry in the table, by clicking on the MAC address
- Choose **Remove**

3.5.2 Address Aging

Aging Time is a variable that must be configured. Its purpose is to determine the amount of time an entry is held in the forwarding tables.



Aging Time: 300 (10 – 1,000,000 seconds)

The default value is set to 300 seconds (5 minutes).

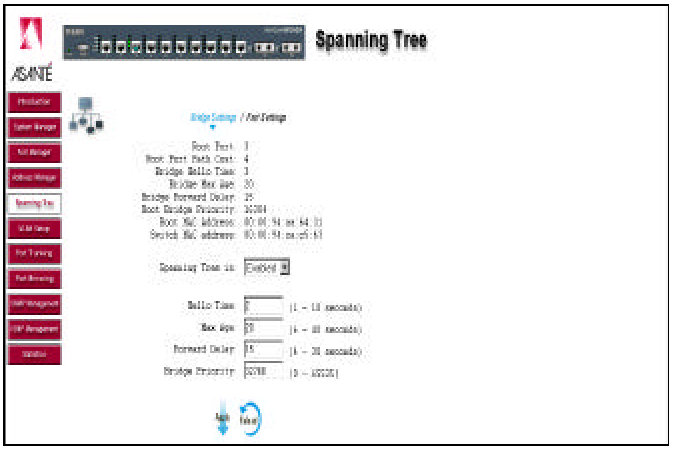
- The administrator may change this value to any value between 10 and 1,000,000 seconds
- After changing the value, click **Apply**

3.6 Spanning Tree

Spanning Tree can be enabled or disabled in this screen (it is enabled by default).

3.6.1 Bridge Settings

Enable: There are four other tunable parameters to be addressed.



Root Port: 1
Root Port Path Cost: 4
Bridge Hello Time: 1
Bridge Max Age: 20
Bridge Forward Delay: 15
Root Bridge Priority: 16384
Root MAC Address: [illegible]
Switch MAC address: [illegible]

Spanning Tree is: Enabled

Hello Time: 2 (1 – 10 seconds)
Max Age: 20 (6 – 40 seconds)
Forward Delay: 15 (4 – 30 seconds)
Bridge Priority: 32768 (0 – 65535)

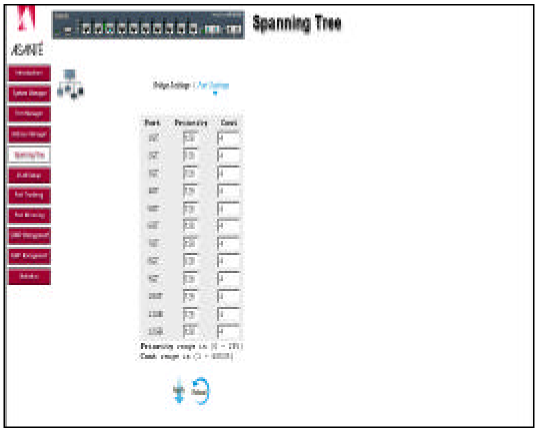
- Hello Time: Interval between configuration messages sent by the spanning tree algorithm
- Max Age: Amount of time before a configuration message is discarded by the system
- Forward Delay: Amount of time system spends in “learning” and “listening” states
- Bridge Priority: Priority setting among other switches in the spanning tree

Disable: Disable spanning tree algorithm on the system.

Click **Apply** after setting your parameters.

3.6.2 Port Settings

For the Port Settings options, you can specify spanning tree parameters for each port. These parameters include port priority and path cost.



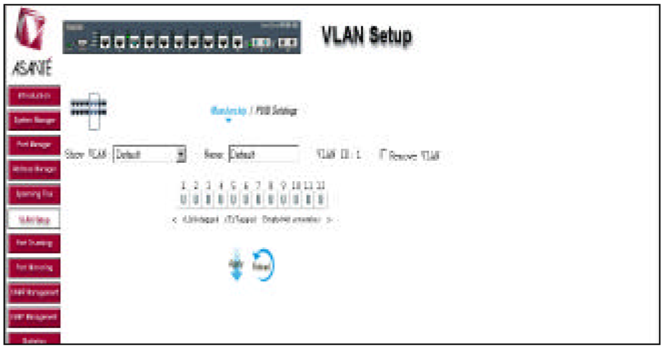
3.7 VLAN Setup

The VLAN tagging option is a standard set by the IEEE to facilitate the spanning of Virtual Local Area Networks (VLANs) across multiple switches (Reference: IEEE standard 802.1Q-1998 Virtual Bridged Local Area Networks).

This page has two options: Membership and PVID Settings.

3.7.1 Membership

The VLAN Membership option allows users to define VLAN groups. Under the **Show VLAN** pull-down menu, the **Add a new VLAN** option will create a new VLAN.



Show VLAN: Default Name: Default VLAN ID: 1 □ Remove VLAN

Add VLAN Group:

- Click on the **Add a new VLAN** under the **Show VLAN** menu
- Enter the VLAN ID and name under the **Add a new group** option
- Click **Apply**

Remove VLAN Group:

- Select the VLAN you want to remove from the *Show VLAN* menu
- Check the **Remove VLAN**
- Click **Apply**

Add VLAN Membership:

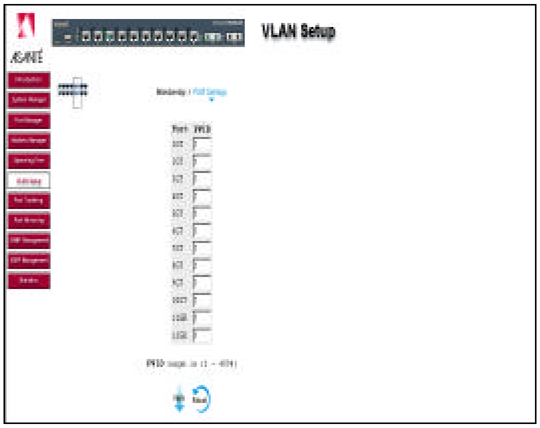
- Select the VLAN you want to modify
- Click the box below the port number on the line of the VLAN, so that a “T” (tagged) or “U” (untagged) appears

Remove VLAN Membership:

- Click the box again until a blank box appears. This will remove VLAN membership from the port

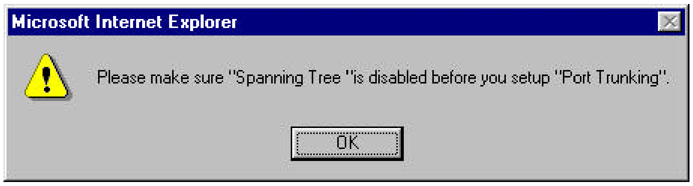
3.7.2 Port VLAN ID (PVID) Settings

All untagged packets entering the switch will by default be tagged with the ID specified by the port’s PVID. This screen allows you to specify the PVID for each port (the PVID range is 1 – 4094).



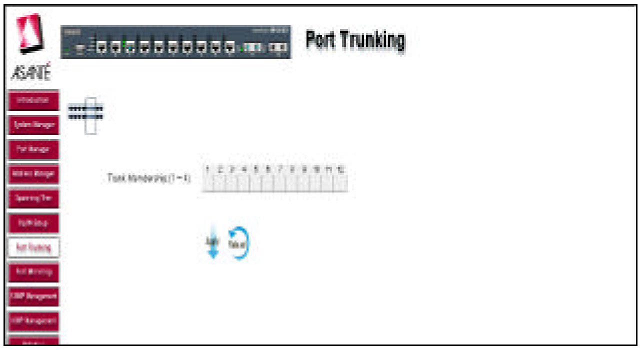
3.8 Port Trunking

Note: Please make sure that Spanning Tree is disabled before you set up Port Trunking.



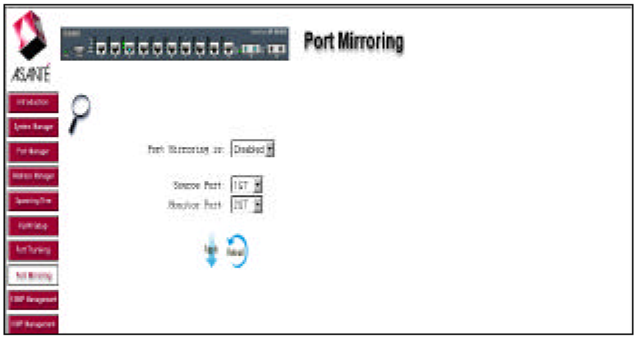
Please make sure "Spanning Tree "is disabled before you setup "Port Trunking".

Port Trunking is a feature that allows multiple links between switches to work as one virtual link or aggregate link. Trunks can be defined for similar port types only. For example, a 10/100 port cannot form a port trunk with a gigabit port. For 10/100 ports, trunks can only be formed within the same cluster. A cluster is a set of eight ports.



3.9 Port Mirroring

Port mirroring is a feature to help in the debugging of a network. This web interface page allows enabling or disabling of port mirroring and the setting of source and monitor ports. The Monitor port will show a copy of every packet that arrives or leaves the source port.



Port Mirroring is: Disabled

Source Port: 1ST

Monitor Port: 2ST

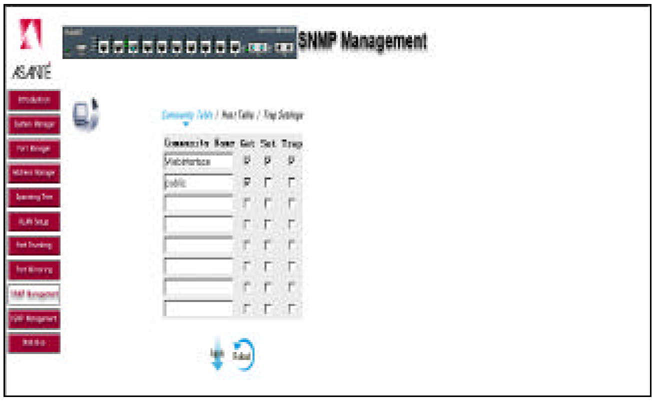
3.10 SNMP (Simple Network Management Protocol) Management

The SNMP menu contains the following sub-menus:

- Community Table
- Host Table
- Trap Settings

3.10.1 Community Table

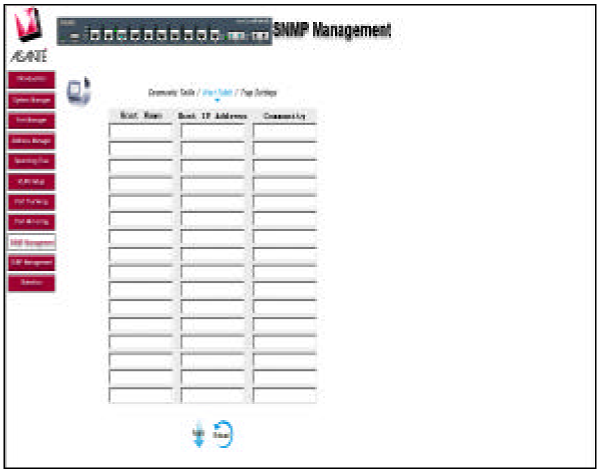
In the Community Table the administrator can create different community strings with customized access by choosing combinations of GET, SET and TRAP rights. Click **Apply** after you've entered the new parameters.



Community Name	Get	Set	Trap
[illegible]	☑	☑	☑
public	☑	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

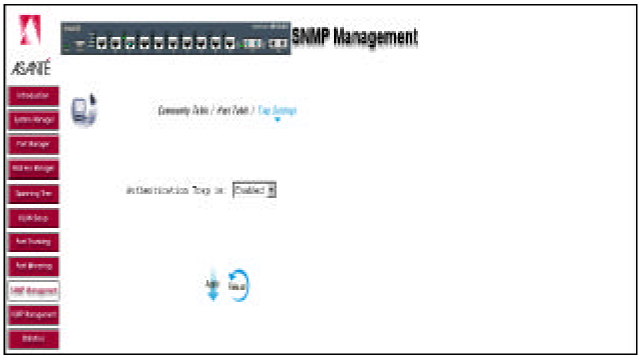
3.10.2 Host Table

The SNMP Host Table screen allows you to add and remove hosts from access rights that have been granted to community groups. The permissions GET, SET and TRAP are assigned to a community name and then these permissions are assigned to individual machines by adding those machines and their IP address to the appropriate community string. Host Authorization can be enabled or disabled.



3.10.3 Trap Settings

The SNMP Trap Setting allows for the enabling or disabling of authentication traps:



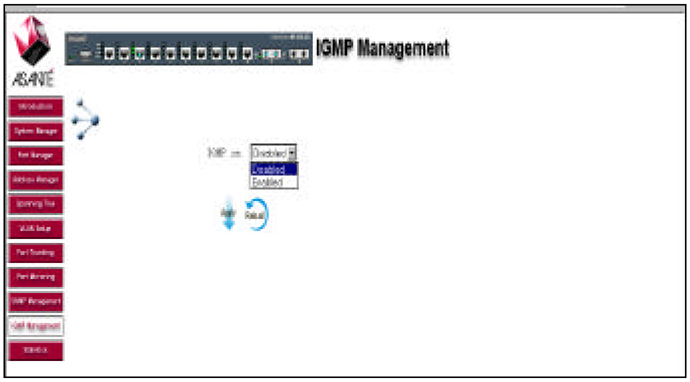
Authentication Trap is: Enabled

- Enable: The system will generate a SNMP trap upon a host authorization failure
- Disable: Authentication traps will not be generated

All hosts in communities with TRAP privileges will be notified when a trap condition occurs.

3.11 IGMP (Internet Group Management Protocol) Management

IGMP is the Internet control protocol used by IP hosts to report their multicast group memberships to any neighboring multicast router. Enable IGMP to achieve automatic multicast filtering for efficient bandwidth utilization.



IGMP on: Disabled

3.12 Statistics

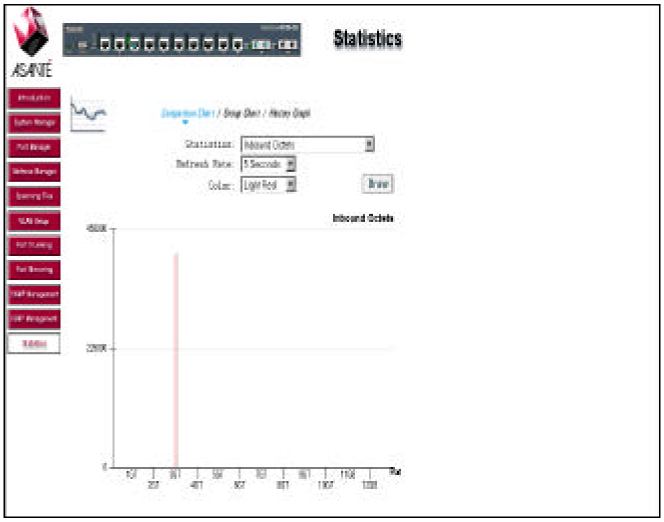
The statistics page allows the administrator to chart different system data. There are three options on this page:

- Comparison Chart
- Group Chart
- History Graph

All charts have a maximum ceiling of 2 31 –1. Click on any line or bar on the charts to see its value.

3.12.1 Comparison Chart

This chart allows you to look at all of the ports and graph information on one type of statistic. There are three parameters to set: Statistic, Refresh Rate and Color.



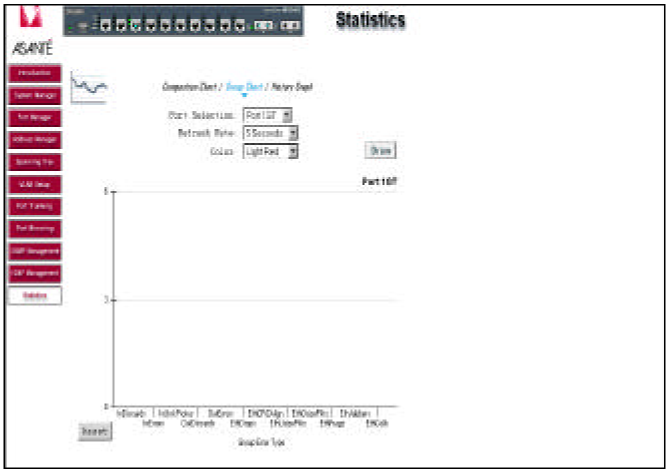
Statistics: Inbound Octets
Refresh Rate: 5 Seconds
Color: Light Red

- Statistics: The type of system data to be monitored
- Refresh Rate: The time interval between automatic refreshes
- Color: The color setting for the chart

When all of the variables are set, click **Draw**.

3.12.2 Group Chart

This chart tracks the types of errors that have occurred on one port. Enter the port selection, the refresh rate and the color.

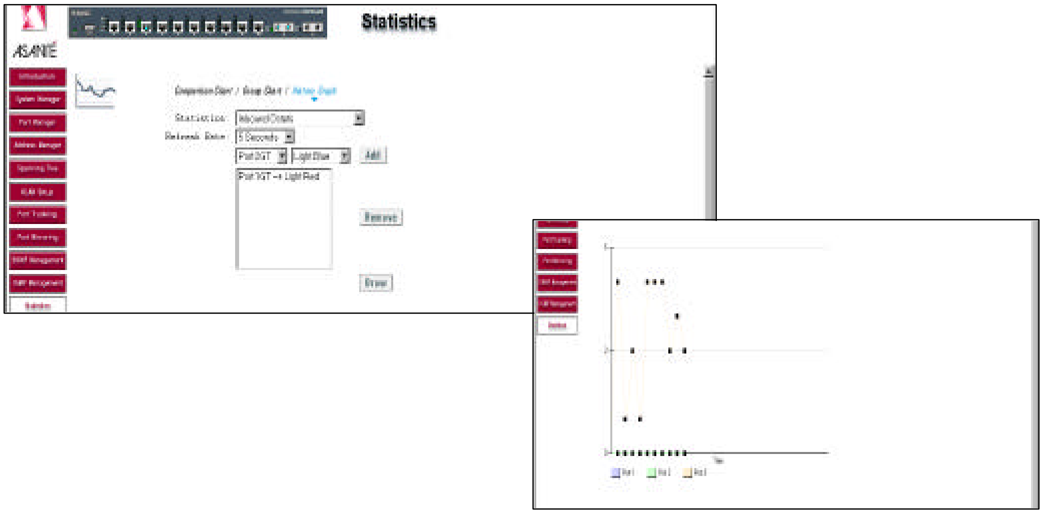


Port Selection: Port 1GT
Refresh Rate: 5 Seconds
Color: Light Red

When all of the variables are set, click **Draw**. Click **Reset** to start again.

3.12.3 History Graph

This page will graph data over time, allowing you to compare each port’s activity. Select the type of data to monitor. Choose a color for each port and click **Add** to include that port in the graph. Click **Draw** when all the desired ports are entered. To remove a port from the graph, highlight the correct line and click **Remove**.



Refresh Rate: 5 Seconds
Port 2GT Light Blue
Port 1GT -> Light Red

Chapter 4 Console Interface

The console, using VT100 terminal emulation, can be accessed from the RS232 serial port or a telnet connection. The switch offers password protection for this interface. All of the following examples of the Console's User Interface show a screen capture from a telnet session.

When attached to the User Interface via a telnet session, make sure that your telnet application is configured to use VT100 emulation.

Please refer to *Chapter 6 Switching Concepts* to review any features that are not familiar to you.

4.1 User Interface

The switch offers a menu-driven interface. The initial welcome screen requires a password entry in order to proceed. If there is no password set on the system, the Main Menu will be displayed and access is granted immediately. By default, password protection is disabled. If enabled, the default password is **Asante**. To enable password protection, see *Chapter 2.4*.

Note: **Asante** is case sensitive and must appear exactly as it is shown here.

4.2 Characteristics

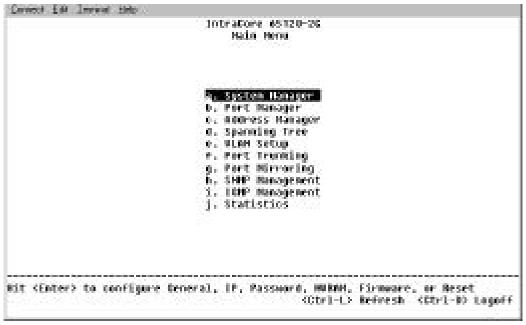
There are several characteristics to the User Interface pages that are necessary to know before proceeding to use it. The arrow keys may be used to move within menus and sub-screens. At the bottom of every screen are some key commands available to the user for that particular screen, as well as some helpful information. The common keystrokes and their definitions and intricacies are listed below:

• ESC	Return to the previous menu or screen, or abort editing
• Ctrl-L	Refresh the screen
• Ctrl-D	Log off
• Ctrl-W	Saves current configuration to NVRAM
• Spacebar	Toggles between possible settings for a field
• Enter	Select a menu item, edit a field, or accept a value after editing a field
• Ctrl-X	Delete a table entry

4.3 Main Menu

The main menu displays all the sub-menus that are available. By pressing **Enter** at a highlighted option you will confirm the choice of the specified sub-menu. There are ten menu items to choose from:

- System Manager
- Port Manager
- Address Manager
- Spanning Tree
- VLAN Setup
- Port Trunking
- Port Mirroring
- SNMP Management
- IGMP Management
- Statistics



```
                         IntraCore 65120-2G
                             Main Menu



                         a. System Manager
                         b. Port Manager
                         c. Address Manager
                         d. Spanning Tree
                         e. VLAN Setup
                         f. Port Trunking
                         g. Port Mirroring
                         h. SNMP Management
                         i. IGMP Management
                         j. Statistics

-----------------------------------------------------------------------
Hit <Enter> to configure General, IP, Password, NVRAM, Firmware, or Reset
                                      <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

To log out of the user interface, press **Ctrl+D** at anytime during your telnet session. You will be brought back to the login screen.

4.4 System Manager

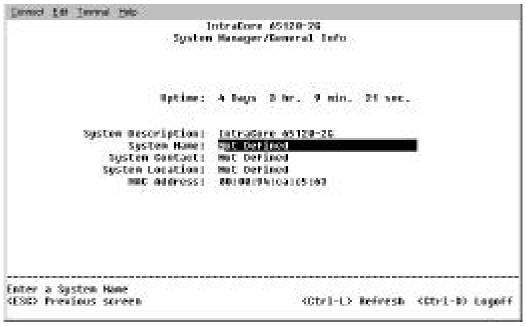
This menu contains all the options needed for basic configuration of the switch. Menu items are:

- General Info
- IP Settings
- Security Admin
- NVRAM Admin
- Firmware Update
- Reset

4.4.1 General Info

This screen displays the following:

- System Description
- System Name- user definable
- System Contact-user definable
- System Location-user definable
- MAC Address

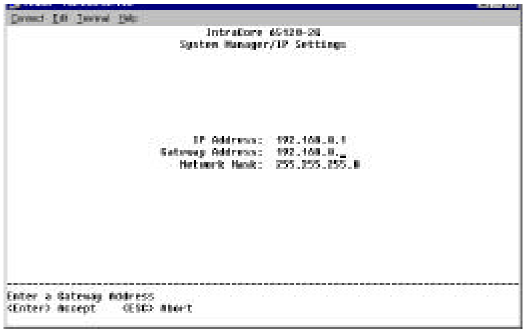


```
                         IntraCore 65120-2G
                   System Manager/General Info


                 Uptime:  4 Days  0 hr.  9 min.  21 sec.

    System Description:  IntraCore 65120-2G
           System Name:  Not Defined
        System Contact:  Not Defined
       System Location:  Not Defined
           MAC Address:  00:00:94:ca:c5:03

--------------------------------------------------------------------------
Enter a System Name
<ESC> Previous screen                  <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

4.4.2 IP Settings

This menu manages the IP related information of the system.

- Enter a site-specific IP address, Gateway Address, and Network Mask (or subnet mask). Consult your network administrator for the information
- Press **Ctrl+W** to save any changes made

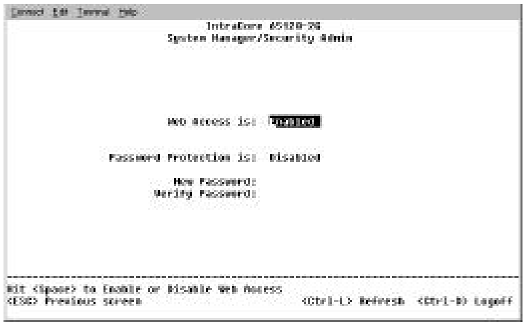


```
                         IntraCore 65120-2G
                    System Manager/IP Settings


                 IP Address:  192.168.0.1
            Gateway Address:  192.168.0._
               Network Mask:  255.255.255.0

--------------------------------------------------------------------------
Enter a Gateway Address
<Enter> Accept     <ESC> Abort
```

4.4.3 Security Admin

This screen allows the user to setup the following security features:

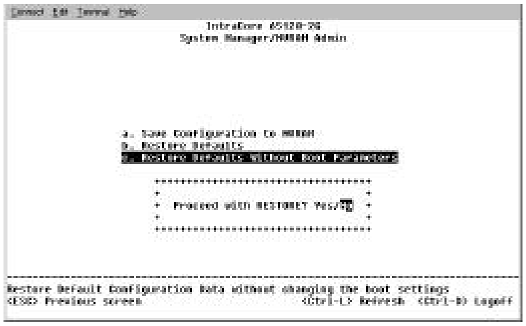
- Web access—The web browser interface is disabled by default. Use the arrows on the keyboard to highlight this field and press the spacebar to enable this feature.
- Password Protection—Anyone on the network can access the switch via telnet until you've enabled the password protection feature. Highlight this field and press the spacebar to enable this feature. Enter your new password, enter it again to verify, and press **Ctrl+W** to save your changes.



```
                         IntraCore 65120-2G
                  System Manager/Security Admin


                 Web Access is:  Disabled

       Password Protection is:  Disabled

                  New Password:
               Verify Password:

--------------------------------------------------------------------------
Hit <Space> to Enable or Disable Web Access
<ESC> Previous screen                  <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

4.4.4 Non-Volatile Random Access Memory (NVRAM) Admin

This screen allows the user to save any configuration changes that are made, or to restore the default settings (choosing *Restore Defaults without Boot Parameters* will reset most defaults, but not the IP address and boot loader configuration). Highlight the desired choice and press **Enter**. Select **Yes** to confirm. You may also save any changes to NVRAM at each sub-menu by pressing **Ctrl+W** and selecting **Yes** to confirm.

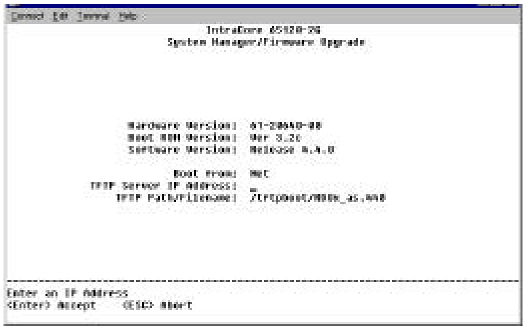


```
                    IntraCore 65120-2G
                 System Manager/NVRAM Admin

         a. Save Configuration to NVRAM
         b. Restore Defaults
         c. Restore Defaults Without Boot Parameters

            ********************************
            *                              *
            *  Proceed with RESTORE? Yes/No *
            *                              *
            ********************************
-------------------------------------------------------------------------
Restore Default Configuration Data without changing the boot settings
<ESC> Previous screen                     <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.4.5 Firmware Update

This screen allows users to select an image file and the location from where it can be downloaded using TFTP. There are three options: *Net*, *Net & Save*, and *Last Saved* (Please refer to Chapter 5 when updating software.).

- *Net* option—This option allows the user to try out a new image before upgrading. It requires a TFTP filename and a server IP address to retrieve the specified image from the given IP address.
- *Net & Save* option—This option requires the same setup as the Net option, i.e. TFTP server and a new image. However, it copies the image to the flash directly and the system reboots from the flash afterwards.
- *Last Saved* option—This option will automatically take effect after the Net & Save option is selected and the unit is reset.

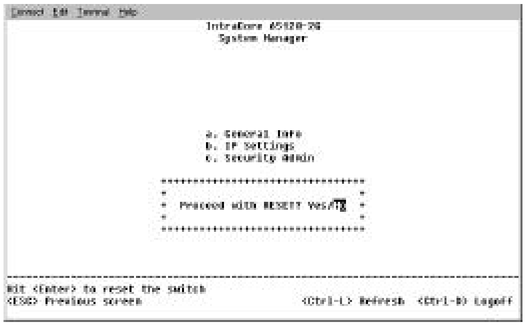


```
                    IntraCore 65120-2G
              System Manager/Firmware Upgrade

          Hardware Version:  01-20040-00
          Boot ROM Version:  Ver 3.20
          Software Version:  Release 4.4.0

                 Boot From:  Net
     TFTP Server IP Address:  _
        TFTP Path/Filename:  /tftpboot/MBBe_as.000
-------------------------------------------------------------------------
Enter an IP Address
<Enter> Accept    <ESC> Abort
```

Note: The previous image in the flash will be lost when the procedure completes.

4.4.6 Reset

To reset the switch to its original default settings, select *Reset* from the System Manager menu. Select *Yes* to proceed, and press **Enter**.



```
                    IntraCore 65120-2G
                      System Manager

                    a. General Info
                    b. IP Settings
                    c. Security Admin

             ******************************
             *                            *
             *  Proceed with RESET? Yes/No *
             *                            *
             ******************************
-------------------------------------------------------------------------
Hit <Enter> to reset the switch
<ESC> Previous screen                     <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

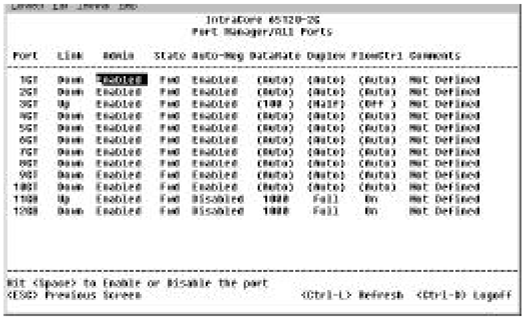
4.5 Port Manager

The Port Manager screen allows the user to arrange the port characteristics related to link operations. Select ***a**. All Ports* to arrange multiple port configurations, or ***b**. Port Specific* to configure one port at a time. Use the spacebar to toggle between selections.

4.5.1 All Ports

From the All Ports screen, the following characteristics can be configured:

- **Admin field:** Allows Administrator to Enable or Disable the port
- **Auto-Neg:** Allows the Administrator to enable or disable the auto-negotiation for the port
- **Duplex field:** Offers the choice of Full, Half, or Auto (will auto-detect the value of the attached device and set the port duplex accordingly)
- **Flow Control:** Flow control stops the sender from sending data until the receiver can accept it
- **Comments:** Allows the administrator to name the port or make comments



```
                          IntraCore 65120-2G
                         Port Manager/All Ports

Port   Link   Admin   State Auto-Neg DataRate Duplex FlowCtrl Comments
--------------------------------------------------------------------------
 1GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
 2GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
 3GT   Up     Enabled  Fwd  Enabled   (100 )  (Half)  (Off )  Not Defined
 4GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
 5GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
 6GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
 7GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
 8GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
 9GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
10GT   Down   Enabled  Fwd  Enabled   (Auto)  (Auto)  (Auto)  Not Defined
11GB   Up     Enabled  Fwd  Disabled   1000    Full    On     Not Defined
12GB   Down   Enabled  Fwd  Disabled   1000    Full    On     Not Defined

--------------------------------------------------------------------------
Hit <Space> to Enable or Disable the port
<ESC> Previous Screen                    <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.5.2 Port Specific

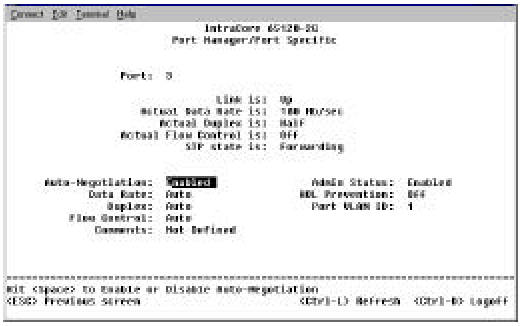
The options here are similar to those in the All Ports menu. The difference is that only the specified port will be changed.

The upper half of this screen shows the current status for the following parameters:

- Link Status
- Duplex
- Data Rate
- Port State

From the Port Specific screen, the following characteristics can be configured:

- Auto-Negotiation
- Data rate
- Duplex
- Flow Control
- Comments
- Admin Status
- HOL Prevention
- Port VLAN ID



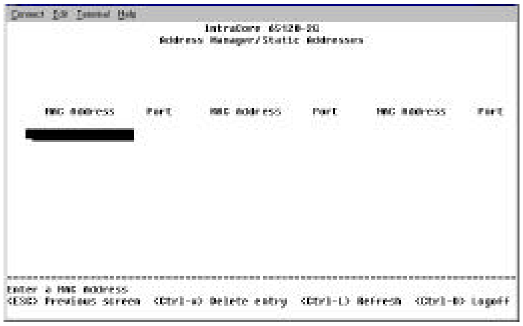
```
                          IntraCore 65120-2G
                      Port Manager/Port Specific


              Port:  3

                          Link is:  Up
            Actual Data Rate is:  100 Mb/sec
               Actual Duplex is:  Half
         Actual Flow Control is:  Off
                      STP state is:  Forwarding

   Auto-Negotiation:  Enabled               Admin Status:  Enabled
          Data Rate:  Auto                HOL Prevention:  Off
             Duplex:  Auto                  Port VLAN ID:  1
       Flow Control:  Auto
           Comments:  Not Defined

==========================================================================
Hit <Space> to Enable or Disable Auto-Negotiation
<ESC> Previous screen                    <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.6 Address Manager

This screen allows the user to configure the Static Bridge Table and to set the Aging time.

4.6.1 Static Addresses

Systems whose MAC address and port number are listed in this screen will not be purged from the forwarding table by the Aging process. Enter the desired MAC Addresses and port numbers and press **Ctrl+W** to save your changes.

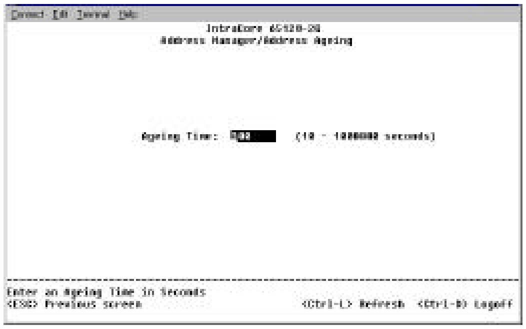


```
                          IntraCore 65120-2G
                   Address Manager/Static Addresses



    MAC Address      Port      MAC Address      Port      MAC Address      Port




==========================================================================
Enter a MAC Address
<ESC> Previous screen  <Ctrl-a> Delete entry  <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.6.2 Address Aging

Aging Time is a variable that must be configured. Its purpose is to determine the length of time an entry is held in the forwarding tables. The default value is set at 300 seconds (5 minutes).

The Administrator may change this value to any value between 10 and 1,000,000 seconds.



```
                  IntraCore 65120-2G
          Address Manager/Address Ageing

        Ageing Time: 300      (10 - 1000000 seconds)

-----------------------------------------------------------------
Enter an Ageing Time in Seconds
<ESC> Previous screen                 <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

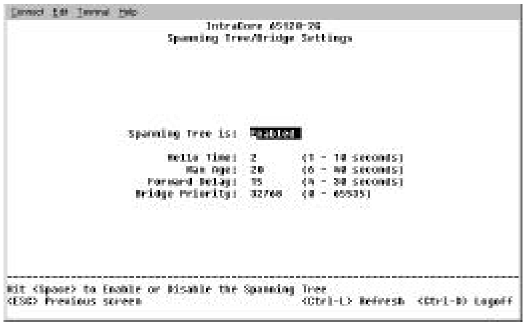
4.7 Spanning Tree

Spanning Tree can be enabled or disabled in this screen.

4.7.1 Bridge Settings

Enable: There are four other parameters to set when Spanning Tree is enabled.

- Hello Time: Interval between configuration messages sent by the spanning tree algorithm
- Max Age: Amount of time before a configuration message is discarded by the system
- Forward Delay: Amount of time system spends in “learning” and “listening” states
- Bridge Priority: Priority setting among other switches in the spanning tree

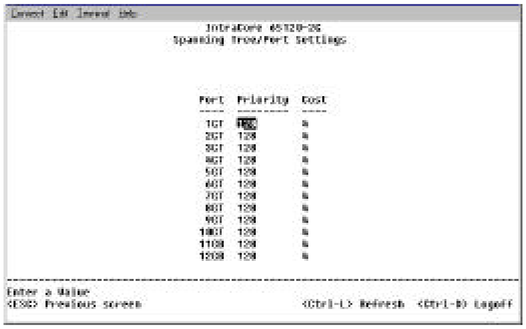


```
                  IntraCore 65120-2G
            Spanning Tree/Bridge Settings

      Spanning Tree is: Enabled

           Hello Time:  2       (1 - 10 seconds)
              Max Age:  20      (6 - 40 seconds)
        Forward Delay:  15      (4 - 30 seconds)
      Bridge Priority:  32768   (0 - 65535)

-----------------------------------------------------------------
Hit <Space> to Enable or Disable the Spanning Tree
<ESC> Previous screen                 <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

Disable: Disable spanning tree algorithm on the system.

4.7.2 Port Settings

On this screen, you can specify spanning tree parameters for each port. These parameters include port priority and path cost.



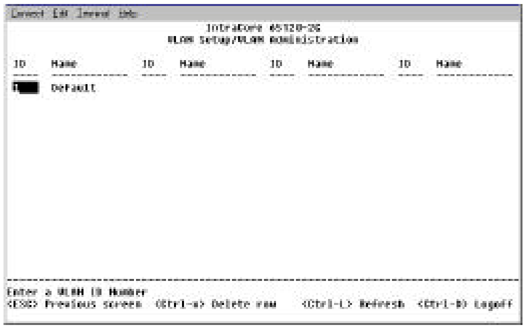
```
                  IntraCore 65120-2G
             Spanning Tree/Port Settings

              Port   Priority   Cost
              -----  ---------  ----
               1GT   128        4
               2GT   128        4
               3GT   128        4
               4GT   128        4
               5GT   128        4
               6GT   128        4
               7GT   128        4
               8GT   128        4
               9GT   128        4
              10GT   128        4
              11GB   128        4
              12GB   128        4

-----------------------------------------------------------------
Enter a Value
<ESC> Previous screen                 <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

4.8 VLAN Setup

The VLAN tagging option is a standard set by the IEEE to facilitate the spanning of VLANs across multiple switches (Reference: IEEE standard 802.1Q-1998 Virtual Bridged Local Area Networks).

4.8.1 VLAN Administration

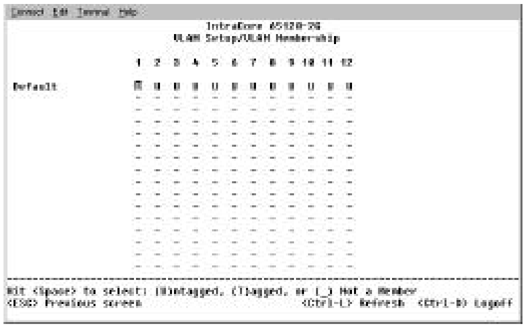
In this screen the user can add new VLAN groups by entering the VLAN ID and name.



```
                            IntraCore 65120-2G
                      VLAN Setup/VLAN Administration

ID    Name          ID    Name          ID    Name          ID    Name
----  ------------  ----  ------------  ----  ------------  ----  ------------
1     Default

------------------------------------------------------------------------------
Enter a VLAN ID Number
<ESC> Previous screen  <Ctrl-x> Delete row    <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

4.8.2 VLAN Membership

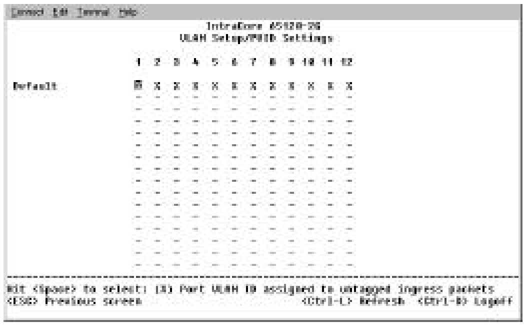
Here the user can define VLAN groups by marking each port “T” (tagged) or “U” (untagged). Use the space bar to select “T” or “U”. Leaving a space blank will remove VLAN membership from the port.



```
                            IntraCore 65120-2G
                       VLAN Setup/VLAN Membership

                    1  2  3  4  5  6  7  8  9 10 11 12

Default             U  U  U  U  U  U  U  U  U  U  U  U
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
------------------------------------------------------------------------------
Hit <Space> to select: (U)ntagged, (T)agged, or (_) Not a Member
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

4.8.3 Port VLAN ID (PVID) Settings

All untagged packets entering the switch will by default be tagged with the ID specified by the port’s PVID. This screen allows the user to specify the PVID for each port.

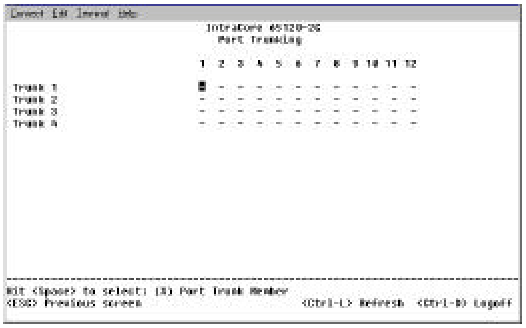


```
                            IntraCore 65120-2G
                        VLAN Setup/PVID Settings

                    1  2  3  4  5  6  7  8  9 10 11 12

Default             X  X  X  X  X  X  X  X  X  X  X  X
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
                    _  _  _  _  _  _  _  _  _  _  _  _
------------------------------------------------------------------------------
Hit <Space> to select: (X) Port VLAN ID assigned to untagged ingress packets
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

4.9 Port Trunking

Note: Please make sure that Spanning Tree is disabled before you set up Port Trunking.

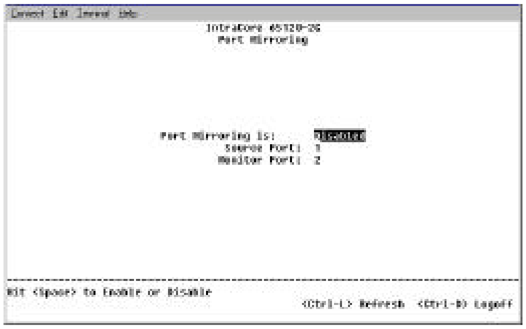
Port Trunking is a feature that allows multiple links between switches to work as one virtual link or aggregate link. Trunks can be defined for similar port types only. For example, a 10/100 port cannot form a port trunk with a gigabit port. For 10/100 ports, trunks can only be formed within the same cluster. A cluster is a set of eight ports.



```
                            IntraCore 65120-2G
                              Port Trunking

                              1  2  3  4  5  6  7  8  9 10 11 12

Trunk 1                       _  _  _  _  _  _  _  _  _  _  _  _
Trunk 2                       _  _  _  _  _  _  _  _  _  _  _  _
Trunk 3                       _  _  _  _  _  _  _  _  _  _  _  _
Trunk 4                       _  _  _  _  _  _  _  _  _  _  _  _

------------------------------------------------------------------------------
Hit <Space> to select: (X) Port Trunk Member
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

4.10 Port Mirroring

Port Mirroring is a feature to help in the debugging of a network. This screen allows for the enabling or disabling of port mirroring and the setting of source and monitor ports. The monitor port will show a copy of every packet that arrives or leaves the source port.



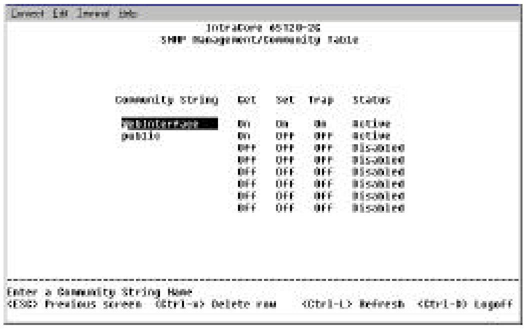
```
                     IntraCore 65120-2G
                       Port Mirroring


              Port Mirroring is:     Disabled
                     Source Port:  1
                    Monitor Port:  2


------------------------------------------------------------------
Hit <Space> to Enable or Disable
                                <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.11 Simple Network Management Protocol (SNMP) Management

This management protocol allows the user to configure the Community Table, Host Table and Trap Settings for the network.

4.11.1 Community Table

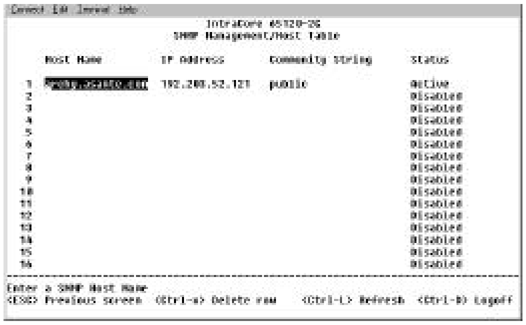
In the Community Table the administrator can create different community strings with customized access by choosing combinations of GET, SET and TRAP rights.



```
                     IntraCore 65120-2G
               SNMP Management/Community Table


             Community String   Get   Set   Trap   Status

              WebInterface      On    On    On     Active
              public            On    OFF   OFF    Active
                                OFF   OFF   OFF    Disabled
                                OFF   OFF   OFF    Disabled
                                OFF   OFF   OFF    Disabled
                                OFF   OFF   OFF    Disabled
                                OFF   OFF   OFF    Disabled
                                OFF   OFF   OFF    Disabled

------------------------------------------------------------------
Enter a Community String Name
<ESC> Previous screen  <Ctrl-a> Delete row   <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.11.2 Host Table

The SNMP Host Table screen allows the user to add and remove hosts from access rights that have been granted to community groups. The permissions GET, SET and TRAP are assigned to a community name and then these permissions are assigned to individual machines by adding those machines and their IP addresses to the appropriate community string.

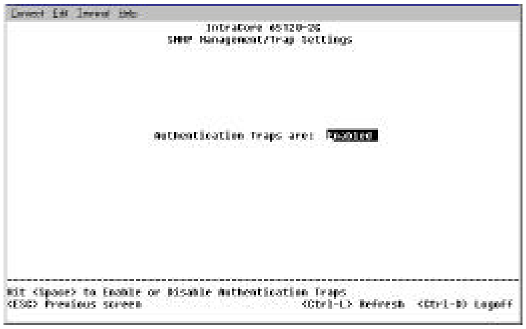


```
                     IntraCore 65120-2G
                 SNMP Management/Host Table

    Host Name        IP Address       Community String      Status

 1  [illegible]      192.208.52.121   public                Active
 2                                                          Disabled
 3                                                          Disabled
 4                                                          Disabled
 5                                                          Disabled
 6                                                          Disabled
 7                                                          Disabled
 8                                                          Disabled
 9                                                          Disabled
10                                                          Disabled
11                                                          Disabled
12                                                          Disabled
13                                                          Disabled
14                                                          Disabled
15                                                          Disabled
16                                                          Disabled
------------------------------------------------------------------
Enter a SNMP Host Name
<ESC> Previous screen  <Ctrl-a> Delete row   <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.11.3 Trap Settings

The SNMP Trap Settings allows for the enabling or disabling of an authentication trap:

- Enable: The system will generate a SNMP trap upon a host authorization failure
- Disable: The authentication traps will not be generated

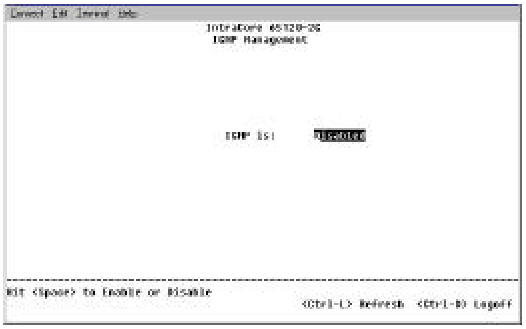


```
                     IntraCore 65120-2G
                SNMP Management/Trap Settings


             Authentication Traps are:  Disabled


------------------------------------------------------------------
Hit <Space> to Enable or Disable Authentication Traps
<ESC> Previous screen           <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

All hosts in community strings with TRAP privileges will be notified when a trap condition occurs.

4.12 Internet Group Management Protocol (IGMP) Management

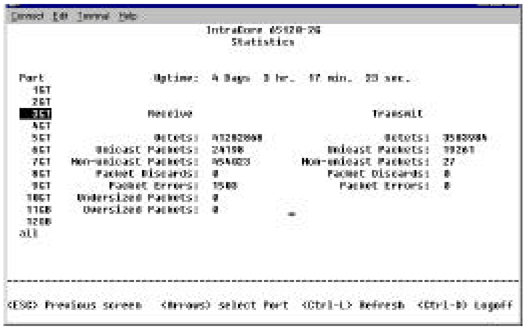
IGMP is the Internet control protocol used by IP hosts to report their multicast group memberships to any neighboring multicast router. Enable IGMP to achieve automatic multicast filtering for efficient bandwidth utilization.



```
                        IntraCore 65120-2G
                         IGMP Management



                     IGMP is:       Disabled





------------------------------------------------------------------
Hit <Space> to Enable or Disable
                                 <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

4.13 Statistics

This screen views the statistics for each port.



```
                        IntraCore 65120-2G
                            Statistics

 Port           Uptime:  4 Days  3 hr.  17 min.  23 sec.
   1GT
   2GT
   3GT            Receive                           Transmit
   4GT
   5GT             Octets:  41282068                  Octets:  3583984
   6GT    Unicast Packets:  24198           Unicast Packets:  19261
   7GT Non-unicast Packets:  954023      Non-unicast Packets:  27
   8GT    Packet Discards:  0               Packet Discards:  0
   9GT      Packet Errors:  1500              Packet Errors:  0
  10GT Undersized Packets:  0
  11GB  Oversized Packets:  0
  12GB
 all

------------------------------------------------------------------
<ESC> Previous screen  <Arrows> select Port  <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

Chapter 5 Firmware Update Procedure

The application firmware is field-updateable. The update procedure and the required equipment are described in this chapter.

Note: Once the system is up, it is controlled by an executing application image residing in the flash memory. No firmware update is possible during this mode. The update can only be done when the system is resetting. To initiate this sequence, the user must set the *boot mode* configuration parameter to *Boot from Net* during normal operation, and then perform a reset. When the *Boot from NET* option is set, Bootstrap can start the system with an image residing on a TFTP server on the network. **Be sure that the TFTP server residing on the network is accessible by the switch**.

Note: It is highly recommended, though not necessary, to use a RS232 serial port connection to the switch during the firmware updating procedure. When using a telnet Session or web interface alone, your connection to the switch will not be available until the switch has entered forwarding mode. This takes approximately three minutes. Once completed, the software version should be verified in the Firmware Update page. If the older version of the software has not been replaced, the unit was unable to reach the new software and booted from the old "flash" version.

The upgrade procedure is as follows:

1. Go to *System Manager/Firmware Update* (in the Web or Console Interface).
2. Set *Boot from Net* option during the normal operation.
3. Verify information such as the IP address for the TFTP Server, Gateway IP address, and the file name and its path of the new image, and then press the **Submit** button, in the Web, or **Ctrl+W**, in the console interface.
4. Restart the system with *Boot from Net* set.
5. Bootstrap will retrieve the new image then pass control to it.
6. The system executes the new image.

Note: The previous image in the flash will not be replaced by the new image using this option.
The image in the flash will be over-written if *Boot from Net and Save* option is selected.

7. If you decide to upgrade to the new image, go to *Firmware Update* again. Set *Boot from Net and Save* option, and press the **Submit** button, in the Web, or **Ctrl+W**, in the console interface.
8. Restart the system with *Boot from Net and Save* set.
9. The new image should over-write the old image in the Flash memory. Verify it by going to the *Firmware Update* screen and checking the Software Release information.

Chapter 6 Switching Concepts

The following sections provide brief explanations of some of the concepts related to switching. If more information is required, please refer to networking textbooks, online resources (i.e. www.oreillynet.com) or your MIS manager.

6.1 Spanning Tree Protocol

The Spanning Tree Protocol (STP) is part of the IEEE 802.1D standard. It provides for a redundant network without the redundant traffic through closed paths. For example, in a network without spanning tree protocol, the same message will be broadcast through multiple paths, which may start an unending packet-passing cycle. This in turn causes a great amount of extra network traffic, leading to network downtime. The STP reduces a network like this, with multiple, redundant connections, to one in which all points are connected, but where there is only one path between any two points (the connections span the entire network, and the paths are branched, like a tree).

6.1.1 How It Works

All of the bridges (a switch is a complex bridge) on the network communicate with each other using special packets of data called Bridge Protocol Data Units (BPDUs). The information exchanged in the BPDUs allows the bridges on the network to do the following:

- Elect a single bridge to be the root bridge
- Calculate the shortest path from each bridge to the root bridge
- Select a designated bridge on each segment, which lies closest to the root and forwards all traffic to it
- Select a port on each bridge to forward traffic to the root
- Select the ports on each bridge that forward traffic, and place the redundant ports in blocking states

6.1.2 Spanning Tree Parameters

The operation of the spanning tree algorithm is governed by several parameters. You should attempt to set these parameters only if you have experience with the 802.1D specification. To set the parameters listed below, access the *Spanning Tree/Bridge Settings* screen (console or telnet), or the *Spanning Tree/Bridge Settings* page (in the web interface).

Bridge Priority

Setting the Bridge Priority to a low value will increase the likelihood that the current bridge will become the root bridge. If the current bridge is located physically near the center of your network, you may wish to decrease the Bridge Priority from its default value of 32768 to make it become the root bridge. If the current bridge is near the edge of your network, it is best to leave the value of the Bridge Priority at its default setting.

Hello Time

This is the time period between BPDUs transmitted by each bridge. The default setting is 2 seconds.

Maximum Age

Each bridge should receive regular configuration BPDUs from the direction of the root bridge. If the maximum age timer expires before the bridge receives another BPDU, it assumes that a change in the topology has occurred, and it begins recalculating the spanning tree. The default setting for Maximum Age is 20 seconds.

Forward Delay

After a recalculation of the spanning tree, the Forward Delay parameter regulates the delay before each port begins transmitting traffic. If a port begins forwarding traffic too soon (before a new root bridge has been selected), the network can be adversely affected. The default value for Forward Delay is 15 seconds.

Note: The above parameters (Hello Time, Maximum Age and Forward Delay) are constrained by the following formula:

(Hello Time + 1) <= Maximum Age <= 2 x (Forward Delay – 1)

In general, reducing the values of these timers will make the spanning tree react faster when the topology changes, but may cause temporary loops as the tree stabilizes in its new configuration. Increasing the values of these timers will make the tree react more slowly to changes in topology, but will make an unintended reconfiguration less likely. All of the bridges on the network will use the values set by the root bridge. It is only necessary to reconfigure that bridge if you wish to change the parameters.

6.1.3 Spanning Tree Port Configuration

To set the Port Priority and Port Path Cost values for STP, access the *Spanning Tree/Port Settings* screen (console or telnet), or the *Spanning Tree/Port Settings* page (in the web interface).

Port Priority

The port priority is a spanning tree parameter that ranks each port, so that if two or more ports have the same path cost, the STP selects the path with the highest priority (the lowest numerical value). By changing the priority of a port, you can make it more, or less, likely to become the root port. The default value is 128, and the value range is 0 – 255.

Port Path Cost

Port path cost is the spanning tree parameter that assigns a cost factor to each port. The lower the assigned port path cost is, the more likely that port will be accessed. The default port path cost for a 10 Mbps or 100 Mbps port is the result to the equation:

Path cost = 1000/LAN speed (in Mbps)

Therefore, for 10 Mbps ports, the default port path cost is 100. For 100Mbps ports, it is 10. To allow for faster networks, the port path cost for a 1000Mbps port is set by the standard at 4.

6.2 Full Duplex, Flow Control and Auto-negotiation

These switching concepts are all related to maintaining a high rate of data transmission necessary for an efficient network.

6.2.1 Full Duplex

Traditionally, Ethernet has operated in half duplex mode, meaning that a node or workstation could either send or receive data, but not both simultaneously. Now, with the use of structured wiring using Unshielded Twisted Pair cabling, and switched Ethernet, a workstation may operate in full duplex mode, sending and receiving data at the same time. The ability to use full duplex mode can potentially double the basic capacity of the channel, so that a Fast Ethernet connection may carry up to 200Mbps.

In order to use full duplex, an Ethernet station must have separate channels to send and receive data. UTP cabling provides this, whereas the older coaxial Ethernet did not. The station must also have a direct connection to a switched port. A station connected to only a repeater cannot operate in full duplex mode. Also, it is critical that both ends of the Ethernet link “agree” on whether the link will operate in full or half duplex. See *6.2.3 Auto-negotiation* for more details.

6.2.2 Flow Control

With a link operating at a high data rate, a switch may experience occasional limitations in the buffer space used to store Ethernet frames before forwarding them. In this situation, if the sending station continues to send frames, the switch will have no option but to discard the frames. This may quickly lead to unacceptable delays in upper-level protocols.

In order to avoid unnecessarily dropping frames, a switch may implement Flow Control. Flow control is a feature that allows the switch to recognize when the buffer space is limited, and to send an Ethernet PAUSE frame to its link partner to cease transmission for a specified period. As with a full duplex link, both ends of the link must understand flow control for the mechanism to operate properly.

6.2.3 Auto-Negotiation

As discussed above, you need to make sure that both ends of a link agree about the duplex and flow control settings to be used (as well as the speed of the connection). In even a mid-sized network, making sure that all the links agree on all these parameters would be too big a job if the network manager had to configure every connection manually.

To make configuration as automatic as possible, the IEEE has defined standards so that most connections can be automatically configured by the hardware, without manual intervention. Devices can agree on the speed, duplex mode and flow control settings for each individual connection. The possible links states are ranked:

1000Mbps/Full Duplex
1000Mbps/Half Duplex (never used)
100Mbps/Full Duplex
100Mbps/Half Duplex
10Mbps/Full Duplex
10Mbps/Half Duplex

With auto-negotiation, the link partners will configure the link to operate at the highest speed and duplex state that both support.

Auto-negotiation is supported on IntraCore switches on all UTP ports. GBIC ports operate at 1Gbps only, and only in full duplex mode, so auto-negotiation is disabled for GBIC ports.

Note: If an Ethernet device that is capable of auto-negotiation is connected to a port that has auto-negotiation turned off, the auto-negotiating device will default to half duplex mode. If the port that is not using auto-negotiation is set to full duplex, the link will have a duplex mismatch, and will so slow that it may be unusable. If you configure an Ethernet port to operate in full duplex mode, you must also configure the link partner to operate in full duplex. It is almost always better to let auto-negotiation take care of this for you.

Appendix A: Troubleshooting

In the unlikely event your network does not operate properly, follow the troubleshooting tips below:

CHECK YOUR POWER CONNECTION. Is the Power LED on? If not plug the power cord into another known working AC outlet.
CHECK YOUR NETWORK CABLE. Are the LINK LEDs on? If not, check the cable connections. Are the connectors seated correctly in each port? Make sure that the correct type of cable is connected to each port.
CHECK YOUR GBIC CONNECTOR. Are the cables inserted correctly? The receiving and transmitting plugs must be inserted into their respective receptacles correctly in order to establish a link.

Appendix B: VLAN Description and Examples

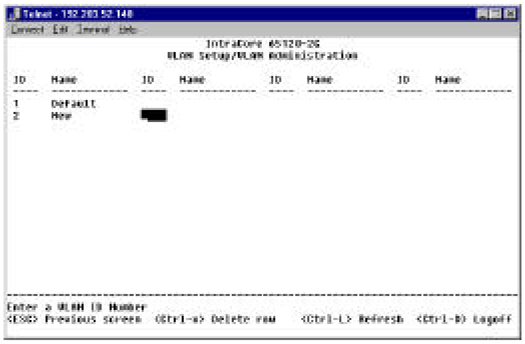
Packets received by the switch will be treated in the following way with regard to the Switch's VLAN settings:

1. When an untagged packet enters a port, it will be automatically tagged with the port's default VLAN ID tag number. Each port has a default VLAN ID setting that is user configurable (the default setting is 1). The default VLAN ID setting for each port can be changed in that port's respective screen in the Port Specific sub-menu (*Port Manager/Port Specific*).
2. When a tagged packet enters a port, the tag for that packet will be unaffected by the default VLAN ID Setting.
3. The packet will now proceed to the VLAN specified by its VLAN ID tag number.
4. If the port in which the packet entered does not have membership with the VLAN specified by the packets VLAN ID tag, the packet will be dropped. Port VLAN membership settings are changed in the VLAN Membership page (*VLAN Setup/VLAN Membership*).
5. If the port has membership to the VLAN specified by the packet's VLAN ID, the packet will be able to be sent to other ports with the same VLAN ID membership.
6. Packets leaving the switch will be either tagged or untagged depending on the setting specified for that port's membership properties.
7. A 'U' for a given port and VLAN will mean that packets leaving the switch from that port and VLAN will be Untagged. A 'T' for a given port and VLAN will mean that packets leaving the switch from that port and VLAN will be tagged with the respective VLAN ID in which it participated in.

Two examples of VLAN setup will be given. Example 1 will step through a simple two-group VLAN setup. Example 2 will step through a more elaborate setup illustrating all possible scenarios for a comprehensive understanding of tagged VLANs. These examples are shown from the Console interface.

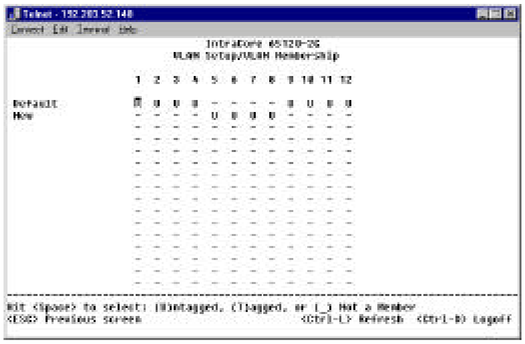
Example 1

1. In the VLAN Administration page, add a new VLAN to the list, shown below as "New" with a VLAN ID value of 2.



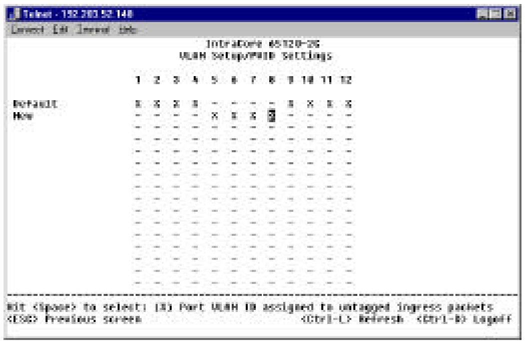
```
                              IntraCore 65120-2G
                        VLAN Setup/VLAN Administration

ID    Name           ID    Name           ID    Name           ID    Name
----  ------------   ----  ------------   ----  ------------   ----  ------------
1     Default
2     New
-------------------------------------------------------------------------------------
Enter a VLAN ID Number
<ESC> Previous screen  <Ctrl-x> Delete row    <Ctrl-L> Refresh  <Ctrl-B> Logoff
```

2. In the VLAN Membership page, use the space bar to toggle matrix until the desired ports are all members of the selected VLAN.



```
                              IntraCore 65120-2G
                          VLAN Setup/VLAN Membership

                           1  2  3  4  5  6  7  8  9  10 11 12

Default                    U  U  U  U  _  _  _  _  U  U  U  U
New                        _  _  _  _  U  U  U  U  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
                           _  _  _  _  _  _  _  _  _  _  _  _
-------------------------------------------------------------------------------------
Hit <Space> to select: (U)ntagged, (T)agged, or (_) Not a Member
<ESC> Previous screen                            <Ctrl-L> Refresh  <Ctrl-B> Logoff
```

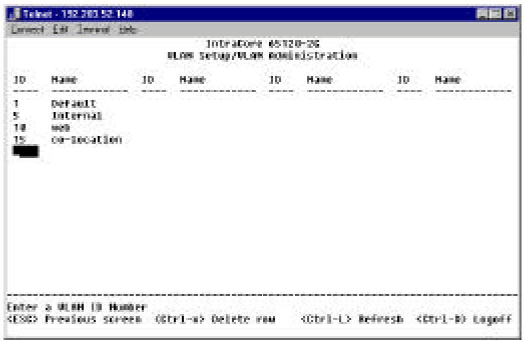
3. To allow untagged packets to participate in the ‘New’ VLAN, make sure to change the Port VLAN IDs for the relevant ports. To access the Port VLAN ID page choose ***c**. PVID Settings* from the VLAN Setup menu. Use the space bar to add an ‘X’ indicating which PVID is assigned to which port.



```
                          IntraCore 65120-2G
                       VLAN Setup/PVID Settings

                 1  2  3  4  5  6  7  8  9 10 11 12

Default          X  X  X  X  -  -  -  -  X  X  X  X
New              -  -  -  -  X  X  X  X  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
--------------------------------------------------------------------------
Hit <Space> to select: (X) Port VLAN ID assigned to untagged ingress packets
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

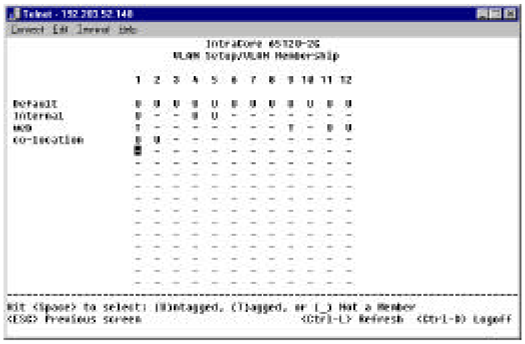
Example 2

1. Setup the following VLANs:



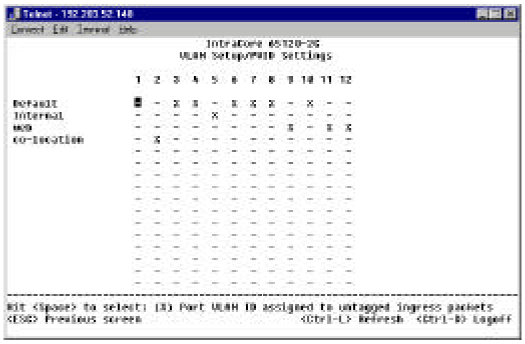
```
                          IntraCore 65120-2G
                    VLAN Setup/VLAN Administration

ID    Name           ID    Name           ID    Name           ID    Name
----  ------------   ----  ------------   ----  ------------   ----  ------------
1     Default
5     Internal
10    Web
15    Co-location


--------------------------------------------------------------------------
Enter a VLAN ID Number
<ESC> Previous screen  <Ctrl-u> Delete row    <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

2. Configure the VLAN membership as follows:



```
                          IntraCore 65120-2G
                      VLAN Setup/VLAN Membership

                 1  2  3  4  5  6  7  8  9 10 11 12

Default          U  U  U  U  U  U  U  U  U  U  U  U
Internal         U  -  -  U  U  -  -  -  -  -  -  -
Web              T  -  -  -  -  -  -  -  T  -  U  U
Co-location      U  U  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
                 -  -  -  -  -  -  -  -  -  -  -  -
--------------------------------------------------------------------------
Hit <Space> to select: (U)ntagged, (T)agged, or (_) Not a Member
<ESC> Previous screen                          <Ctrl-L> Refresh  <Ctrl-D> Logoff
```

3. Setup the Port VLAN IDs as follows (**Note**: The Port One PVID is set to 2. This must be done in the port specific page since there is no VLAN with ID 2):



```
                          IntraCore 65120-2G
                       VLAN Setup/PVID Settings

                1  2  3  4  5  6  7  8  9 10 11 12

Default         █  -  X  X  -  X  X  X  -  X  -  -
Internal        -  -  -  -  X  -  -  -  -  -  -  -
Web             -  -  -  -  -  -  -  -  X  -  X  X
co-location     -  X  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
                -  -  -  -  -  -  -  -  -  -  -  -
------------------------------------------------------------------------
Hit <Space> to select: (X) Port VLAN ID assigned to untagged ingress packets
<ESC> Previous screen                   <Ctrl-L> Refresh  <Ctrl-X> Logoff
```

The specific ports shown above have the following Port VLAN ID settings (The Port VLAN ID settings for each port are configured in their respective Port Specific screen (in the Port Manager Menu) or in the VLAN Administration page):

Port 01: 2
Port 02: 15
Port 03: 1
Port 04: 1

Port 05: 5
Port 06: 1
Port 07: 1
Port 08: 1

Port 09: 10
Port 10: 1
Port 11: 10
Port 12: 10

The following scenarios will produce results as described below:

1. If an untagged packet enters Port 4, the switch will tag it with a VLAN tag value of 1. However, since Port 4 has membership with VLAN ID 5, the packet will be dropped.

2. If a tagged packet with a VLAN tag value 5 enters Port 4, the packet will have access to Ports 5 and 1. If the packet leaves Port 5 and/or 1, it will be stripped of its tag becoming an untagged packet as it leaves the switch.

3. If an untagged packet enters Port 1, the switch will tag it with a VLAN tag value of 2. It will then be dropped since Port 1 has no membership with VLAN ID 2.

4. If a tagged packet with a VLAN tag value 10 enters Port 9, it will have access to Ports: 1, 11, and 12. If the packets leave Port 1, they will be tagged with a VLAN ID value of 10. If the packet leaves Ports 11 or 12, it will leave as an untagged packet.

5. If a tagged packet with a VLAN tag value 1 enters Port 9, it will be dropped since Port 9 does not have membership with VLAN ID 1.

Appendix C: Features, Defaults and Specifications

The IntraCore 65120 is shipped with the following factory default settings and specifications:

- Switching Method: Store-and-forward
- System Packets Buffer Size: 1.5MB
- MAC Address Table: 8000
- Full-Duplex: Standards-based auto-negotiation enabled
- VLAN: 64 port-based VLANs, with IEEE 802.1Q tagging
- Spanning Tree Protocol: 802.1D, enabled
- Priority: 802.1p, 8 levels mapped to 2 queues
- RMON: 4 Groups
- SNMP: MIB-II, Bridge MIB, RMON MIB
- Console Baud Rate: 9600
- Password: Asante (default)
- IP Address: 192.168.0.1 (default)

The following is a summary of features of the 65120 Series Gigabit Ethernet Switch:

- **Model 65120-12G**: 12 1000Base GBIC ports, which supports 802.3z Gigabit Ethernet 1000BaseSX or LX, and 802.3ab Gigabit Ethernet 1000BaseT
- **Model 65120-2G**: 10 Gigabit Ethernet switched ports with RJ-45 Twisted Pair (TP) connectors, which supports 10/100/1000BaseT Ethernet. Each port is capable of detecting 10, 100, or 1000Mbps automatically; 2 1000Base GBIC ports, which supports 802.3z Gigabit Ethernet 1000BaseSX or LX, and 802.3ab Gigabit Ethernet 1000BaseT
- 8K-entry MAC address cache
- Back pressure flow control for half-duplex operation
- IEEE 802.3x flow control for full duplex operation
- IEEE 802.1Q based VLAN
- QoS through dual priority and support for IEEE 802.1p
- IGMP support
- Port Trunking support
- Port Mirroring
- Hardware assisted RMON statistic collection
- Extensive system LED and per port LEDs
- Console port (VT100)
- Telnet remote login
- Web-based management
- On-Board HTTP Server
- Network boot/software download via TFTP
- SNMP-based network management
    - MIB ll (RFC1213)
    - Ethernet Interface MIB (RFC1643)
    - Bridge MIB (RFC1493)
    - 4-Group RMON (RFC1757)
    - Enterprise private MIB
    - IGMP upgradeable
    - Manageable by HP Open View
- Transparent bridge (IEEE 802.1D)
    - Spanning tree protocol
    - Hardware assisted address learning
    - Auto aging
    - Static address entry
- Supports a “Store and Forward” switching engine
- Multimedia support
- An intelligent address recognition mechanism enables forwarding at full wire speed

- Supports up to 64 virtual LANs
- 17-inch and standard 1U chassis high
- Internal power supply

Appendix D: FCC Compliance and Safety Statements

FCC Compliance Statement

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the instructions provided with the equipment, may cause interference to radio and TV communication. The equipment has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If you suspect this equipment is causing interference, turn your Ethernet Switch on and off while your radio or TV is showing interference, if the interference disappears when you turn your Ethernet Switch off and reappears when you turn it back on, there is interference being caused by the Ethernet Switch.

You can try to correct the interference by one or more of the following measures:

1. Reorient the receiving radio or TV antenna where this may be done safely.
2. To the extent possible, relocate the radio, TV or other receiver away from the Switch.
3. Plug the Ethernet Switch into a different power outlet so that the Switch and the receiver are on different branch circuits.

If necessary, you should consult the place of purchase or an experienced radio/television technician for additional suggestions.

Caution: Do not use a RJ-11 (telephone) cable to connect your network equipment.

Important Safety Instructions

1. Read all of these instructions.
2. Save these instructions for later use.
3. Follow all warnings and instructions marked on the product.
4. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
5. Do not use this product near water.
6. Do not place this product on an unstable cart or stand. The product may fall, causing serious damage to the product.
7. The air vent should never be blocked (i.e. by placing the product on a bed, sofa, rug, etc). This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
8. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
9. This product is equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your outlet. Do not defeat the purpose of the grounding type plug.
10. Do not allow anything to rest on the power cord. Do not place this product where persons will walk on the cord.
11. If an extension cord is used with this product, make sure that the total ampere ratings on the products into the extension cord do not exceed the extension cord ampere rating. Also make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
12. Never push objects of any kind into this product through air ventilation slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
13. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to service personnel.

Appendix E: Online Warranty Registration

Before calling Asanté Technical Support, please register your switch online at www.asante.com/support/registration.html. By doing so, you'll be entitled to special offers, up-to-date information and important product bulletins.